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# THE LICHEN-FLORA

OF

# GREAT BRITAIN, IRELAND, AND THE CHANNEL ISLANDS.

OSWESTRY:
PRINTED BY WOODALL AND VENABLES,
CAXTON WORKS.

# THE LICHEN-FLORA

OF

# GREAT BRITAIN, IRELAND, AND THE CHANNEL ISLANDS.

BY THE

REV. W. A. LEIGHTON, B.A.,

OF ST. JOHN'S COLLEGE, CAMBRIDGE, FELLOW OF LINNÆAN SOCIETY OF LONDON, FELLOW OF THE BOTANICAL SOCIETY OF EDINBURGH, HONORARY MEMBER OF THE CRYPTOGAMIC SOCIETY OF SCOTLAND, HONORARY CORRESPONDING MEMBER OF NAT URAL HISTORY SOCIETY OF CHERBOURG, ETC., ETC.

THIRD EDITION.

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1879.

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"Think of the beauty which God has spread abroad for our use; its profuseness in desert spots where none can see it; its minuteness, so that much can only be discovered by a microscope; and its extent, embracing all things."—*Sewell.*

"Meek creatures! the first mercy of the earth, veiling with hushed softness its dentless rocks; creatures full of pity covering with strange and tender honour the sacred disgrace of ruin, laying quiet fingers on the trembling stones to teach them rest. No words that I know of will say what these Mosses and Lichens are; none are delicate enough, none perfect enough, none rich enough. They will not be gathered like the flowers, for chaplet or love-token; but of these the wild bird will make its nest, and the wearied child its pillow, and as the earth's first mercy so they are its last gift to us. When all other service is vain from plant and tree, the soft Mosses and grey Lichens take up their watch by the headstone. The woods, the blossoms, the gift-bearing grasses have done their parts for a time, but these do service for ever. Trees for the builder's yard, flowers for the bride's chamber, corn for the granary, Mosses and Lichens for the grave."—*Ruskin.*

"All organic life commences with excessively minute structures, which are continually reproduced in inconceivable numbers. On land the Lichens first appear on rocks, and the bark of trees, covering them with coloured spots and bands.—*Heer.*

Seeds, to our eye invisible, will find
On the rude rock the bed that fits their kind;
There, in the rugged soil they safely dwell,
Till showers and snows the subtle atoms swell,
And spread th' enduring foliage; then we trace
The freckled flower upon the flinty base;
These all increase, till in unnoticed years
The stony tower as grey with age appears.—*Crabbe.*

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TO

CHARLES LARBALESTIER, Esq.,

*B.A., St. John's College, Cambridge,*

OF ROCHE VUE, ST. AUBIN'S, JERSEY.

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To no one can I more appropriately dedicate this Third Edition of my Lichen-Flora than to you, whose marvellous researches in the West of Ireland and elsewhere, conducted with consummate scientific skill, zeal, and perseverance, have added so largely to our knowledge, and whose unvarying kindness and friendship in communicating authentic specimens of novelties have rendered me service in the preparation of this work altogether inappreciable.

Believe me, gratefully, to remain,

Ever sincerely and affectionately yours,

W. A. LEIGHTON.

*Luciefelde,*
*Shrewsbury,*
*March 25th,* 1879.

# INTRODUCTION.

The Lichenes are a Natural Order of aerial cellular plants intermediate between the Algæ and Fungi, approaching the former principally, but not exclusively, through the Collemacei—and the Ascomycetes of the latter, by having the spores in asci or thecæ and their hymenium often included in a closed receptacle or perithecium. Their own peculiar characteristic is that they have gonidia or minute spherical cellules containing chlorophyll or some green granular matter, generated by the action of light, immediately underneath the cortical layer of the thallus.

They may be found everywhere, clothing rocks, trees, old palings, stones, and earth, and giving to these localities those beautiful patches of colour which the artist delights to touch in, and which give such brilliance and finish to his landscape sketches.

> The living strains which Nature's hand alone,
> Profuse of life, pours forth upon the stone,
> For ever growing; where the common eye
> Can but the bare and rocky bed descry.—*Crabbe.*

Nevertheless, Lichens are not indifferent to either their substratum or locality; some prefer the harder rocks, as granite, micaceous-schist, gneiss, quartz, or sandstone, others calcareous rocks, others the bark of trees and old partially decayed or decaying wood, others the earth, whether calcareous, siliceous, or produced from the decay of vegetable matter; others grow on decayed mosses or jungermanniæ, others on the leaves of evergreens, others again on various substances, as iron, bone, leather, flints, and glass; others again, reduced to apothecia alone, become parasitical on the thalli or apothecia of other Lichens, and others affect both rocks and trees indifferently.

Certain Lichens are peculiar to mountains, others to subalpine regions, others to plains, others to moist places, others to shady places, some like the neighbourhood of water, or even contact with water, others are constantly or partially submerged either in the rocky beds of rivers or on the sea shore, and others again on the under-surface of stones in stone walls or in caves, or on the under-surface of overhanging masses of rock.

They obtain no nutrition by absorption through the prehensile rhizinæ or the hypothallus by which they are attached to the substrata or surfaces on which they grow. All their nutrition is derived from the atmosphere, the water or humidity of which acting chemically on the elements of the different surfaces to which

they are attached, supplies to them in the state of very complex solutions the substances necessary to their existence. Their growth is, therefore, necesssarily slow and intermittent, depending on the dryness or humidity of the atmosphere, on dry or rainy seasons. In the earliest stage of their existence their growth is very rapid under favourable conditions, but when they have attained to a certain size, growth would seem to be arrested and becomes slow. Their duration of life, especially in the fecundity of the reproductive organs, is remarkable and excessive, probably extending to many centuries. They will not grow in a flourishing or perfect condition in the immediate neighbourhood of towns, or where the air is impregnated with smoke, soot, or other deleterious ingredients. In such situations they exist only in a gonidial or rudimentary state, appearing on the trees, walls, &c., as green dust, in which state they will continue for ages, increasing by bisection like the Algæ, but never developing into perfect lichens. The pseudo-genus *Lepraria* of the elder botanists represented this condition. Their abundance in a fully developed and fructiferous condition is a sure and certain indication of the purity of the air and salubrity of the climate.

A lichen consists of a thallus or vegetative portion, bearing the fructification in the apothecium or female fruit, and the spermogonium or supposed male fruit. There are also other bodies, occasionally found on the thallus, termed *pycnides*, which some consider as a kind of secondary fruit, and others as fungilli.

The thallus is very variable in form, size, colour, and consistence, and is either horizontal and membranaceous or foliaceous, or pendulous and filamentose, or occurring in small erect shrublike clusters, or else forming a more or less thick crumbly or powdery crust, investing the surface of rocks and trees, and becoming lobed in various modes in the circumference. If, then, we make a vertical section through a membranaceous thallus, it will be seen to consist generally of a *cortical layer* on the upper surface formed of minute, closely compacted cellules, immediately underneath which is the *gonidial layer* consisting of bright-green spherical cells arranged in an interrupted manner, immediately above the *medullary layer* which consists of interlacing tubular and articulate colourless filaments. The lower surface is either naked, or has a cortical layer similar to the upper one, and also *rhizinæ* or rootlike filaments which attach it to the surface upon which it grows.

If again we make a similar vertical section through a crustaceous thallus, it will exhibit a cortical layer on the upper surface with a gonidial layer immediately underneath, and then the medullary layer, which instead of consisting of filaments has become dead, and transformed into a tartareous mass of abundant molecular granulations, often of oxalate of lime. Underneath the entire lichen is the *hypothallus*, generally of a black or dark-brown colour, formed of filaments or compacted cells, and which in fact is the primordial

vegetation arising from the germination of the spores, and upon which the several other layers of the thallus are gradually and eventually deposited. This hypothallus is often only perceptible in a dark border around the thallus. The thallus is conspicuous enough in the forms above mentioned, but is often *hypophlœodal* or concealed beneath the epidermis of the bark on which it grows, or *evanescent*, existing only in scattered portions on or under the friable face of the rocks, or in other cases altogether wanting when the apothecia grow parasitically on the thallus, or apothecia of other lichens.

The *gonidia* are produced in cells of very young thalli and even in older thalli and are of two sorts—either a simple cell containing granular matter termed a *gonidium*, or clusters of two, three or more spherical granules without any proper cellular membrane, containing green granular matter and named *granula gonima*. These gonidia, together with the molecular granulations, and filaments of the medullary layer, are often protruded through the cortical layer to the surface of the thallus in powdery or granular eruptions of a globular shape termed *soredia*.

The *apothecium* of whatever form, whether patellulate, lirellate, or enclosed in wartlike perithecia or nuclei, has a similar internal structure, and when viewed in a vertical section is seen to consist of an *excipulum*, dark or pale, formed of cells generally compact, subtending the *hypothecium*, of similar structure, and either dark or colourless, from whose upper surface in an erect position grow the *asci* or *thecæ* and the *paraphyses* constituting the *hymenium* or *thalamium*, and are conglutinated by a jellylike mucus termed the *gelatina hymenea*. The *paraphyses* are slender filaments having minute globular or clavate apices filled with coloured granular matter, which, by their close proximity, constitute the disk or *epithecium*, and to which they give their peculiar colour. Around this disk or epithecium is a margin formed by the edges of the excipulum or hypothecium and of the same colour, or else formed by the thallus, and partaking of its peculiar colour. The former is termed a *proper margin*, the latter a *thalline margin*. The *asci* or *thecæ* are linear, clavate, or globular sacs or vesicles containing the *spores*, which in different species are variable in form, size, and colour, either brown or colourless, simple or divided by septa or otherwise into several cells, and in number generally 8, but sometimes 1, 2, 4, 6, or innumerable. The spores contain either granules or oily nuclei, and have an outer and inner paries or wall termed respectively *epispore* and *endospore*.

The *spermogonia* are minute globular conceptacles imbedded in the thallus, distinguishable on its surface as minute tubercles, and in section exhibiting a colourless receptacle from which arise minute filaments either simple *(sterigmata)*, or articulate *(arthrosterigmata)*, bearing on their summits or joints very minute rodlike or cylindrical straight or curved bodies *(spermatia)*, which the slightest pressure detaches and protrudes in a cloudy stream through a pore in the apex of the spermogonium.

The *pycnides* are minute dark-coloured conceptacles, like the perithecia of Sphæriæ, sessile on the thallus and containing simple filaments *(basidia)* bearing singly on their apices, bodies, often oblong, but variable in form and size *(stylospores)*.

On the under-surface of the thallus of the *Stictei* are minute urceolate pale excavations termed *cyphellæ*, whose function is unknown. These are generally empty, but when filled with white or citrine powder are called *pseudocyphellæ*.

The thallus of several genera bears on its upper surface orbicular and flattened, or globular tubercles named *cephalodia*, consisting internally of cells or granula gonima. Their use is unknown. This upper-surface is also frequently found exuberant with minute, erect, coral-like excrescences with dark-coloured apices, and then constitutes the old pseudo-genus *Isidium*, which is now known to be really an anomalous state of the thallus of some Pertusaria. Black powdery patches or spots are scattered on the thallus not unfrequently, which formerly constituted the old pseudo-genus *Spiloma*, but are now considered to consist of minute parasitical fungilli.

In the genus Pertusaria the apothecia become abortive and sterile and converted into soredia, on which state was anciently founded a pseudo-genus *Variolaria*.

The apothecia of certain lichens possess the power of dissolving the surface of the calcareous rocks on which they grow, by means of carbonic acid obtained from the atmosphere, thus forming minute shallow cavities or foveoli, in which they partially bury themselves.

Of the uses to which Lichens may be applied it may suffice to state generally that the "Iceland Moss," *Cetraria islandica*, contains starch and a bitter principle, and is used as a tonic and demulcent in medicine, and in Iceland boiled in milk as food. *Cetraria nivalis* is also nutritious. *Roccella tinctoria*, *Lecanora parella*, *Lecanora tartarea*, *Parmelia saxatilis*, *P. conspersa*, &c., afford valuable dyes. In Sweden, Norway, Finland, and Russia, alcohol or brandy is distilled from *Cladina rangiferina*, which lichen and other *Cladoniæ* are also invaluable in the northern and arctic regions as the food of Reindeer and cows. And in Africa the curious *Lecanora esculenta* which rolls, in a detached state, over the sandy plains, is collected as food for men and horses.

The geographical distribution of Lichens over the world varies according to the different zones, and may be stated generally thus :—In the Arctic regions the *Cladoniæ* and *Stereocaula* occur in immense abundance, covering tracts of country, many square miles in extent, to the almost exclusion of other vegetation, but diminish in profusion gradually as the warmer regions are approached. In the Temperate zone the corticolar Lichens, such as *Lecanorei*, *Lecidei*, *Graphideæ*, and *Verrucarei* abound. In the Tropical zone Lichens attain their maximum development in the *Stictæ*, and *Parmeliæ;* the leaves of evergreen trees are covered with *Strigulæ;*

and the bark with the genera *Thelotrema*, *Verrucaria*, *Trypethelium*, *Chiodecton*, *Graphis*, &c. The *Graphideæ* which abound in this and the temperate zone diminish in number and profusion as the arctic zone is approached. Certain species, especially the saxicolar ones, are cosmopolitan. Our British Lichen-Flora may be taken as a fair representative of the lichens of the Temperate Zone.

If we particularise the several Tribes their distribution may be shewn more clearly, thus :—

BYSSACEI ; entirely in Temperate zone.

LICHINEI ; Temperate.

COLLEMEI ; Temperate, very few Tropical.

MYRIANGIEI ; Temperate, Arctic and Tropical.

CALICIEI ; Temperate, few Tropical.

SPHÆROPHOREI ; Temperate, very few Tropical.

BÆOMYCEI ; Temperate and Tropical.

CLADONIEI ; Arctic, Temperate, decreasing towards Tropics.

STEREOCAULEI ; Temperate and Arctic, especially decreasing towards Tropics.

ROCCELLEI ; Temperate and Tropical.

SIPHULEI ; Temperate and Tropical.

USNEEI ; Cosmopolitan.

RAMALINEI ; Cosmopolitan.

CETRARIEI ; Arctic, Temperate, few in Tropics.

PELTIGEREI ; Temperate, Arctic, few in Tropics.

PARMELIEI ; Temperate, Arctic, decreasing in number in Tropics, but there attaining maximum development in the Stictei.

GYROPHOREI ; Arctic, Temperate, decreasing towards Tropics.

LECANOREI ; chiefly Temperate, Arctic numerous, and Tropics.

LECIDEINEI ; chiefly Temperate, numerous in Arctic and Tropical.

GRAPHIDEI ; chiefly Temperate, few Arctic, numerous Tropical.

PERIDIEI ; Temperate.

PYRENOCARPEI : chiefly Temperate, Arctic many, Tropics comparatively less numerous.

Their variation in altitude is also very great, as may be readily observed in the ascent of lofty hills and mountains, the lichens of the plains occurring at the bases and lower altitudes, and the subalpine lichens making their appearances as one ascends upwards to the very summit. Nevertheless *Cetraria Islandica* and *Cetraria aculeata* occur plentifully, the latter in fructification, on North Wootton Heath, Norfolk, and in Lincolnshire only 200 feet above the level of the sea, probably brought there in a glacial æra and surviving on the retreat of the glacier. On the other hand Sir J. D. Hooker observed *Placodium miniatum* with *Physcia flavicans* on the Himalayan mountains, on the very summit of Bhomtso, alt. 18,590 feet. The former *Placodium miniatum* is the most Arctic, Antarctic, and Alpine lichen in the world, colouring the rocks of an orange-red, as at Bhomptso, and on Cockburn Island in the Antarctic Ocean. *Thamnolia vermicularis*,

*Placodium miniatum*, *Placodium elegans*, *Lecanora oreina*, *Lecanora chlorophana*, *Lecidea geographica*, *and Lecidea atroalba*, all alpine European and Arctic species, occurred in the Donkia Pass, alt. 19,300 feet. At 17,000 feet alt. *Parmelia physodes*, *Lecanora ventosa*, *Lecanora candelaria*, *Lecanora glaucoma*, *Lecanora atra* and *Squamaria chrysoleuca*, all European species, were noted. At 18,300 feet alt. on one stone only, *Gyrophora cylindrica*, *(tripe de roche.)* At 22,000 feet alt. on Irgatzilhassa, Kianglah Mountains, *Physcia flavicans* was also found.

With a view to shew the Geographical Distribution throughout Great Britain and Ireland a line of figures or numbers is added to each Species, corresponding with the Botanical Provinces of Mr. H. C Watson's *Cybele Britannica*, and Moore and More's *Cybele Hibernica*. By this means the student will see at a glance in what counties any particular species has been already gathered, and also what counties are still unexplored for it.

BOT. PROV.

1. = Cornwall, Devon, Somerset.
2. = Wilts, Dorset, Hants, Sussex, Isle of Wight.
3. = Oxford, Bucks, Berks, Herts, Middlesex, Essex, Surrey, Kent.
4. = Norfolk, Suffolk, Hunts, Northampton, Cambridge, Bedford.
5. = Stafford, Salop, Worcester, Warwick, Hereford, Monmouth, Gloucester.
6. = Cardigan, Radnor, Brecon, Glamorgan, Carmarthen, Pembroke.
7. = Anglesea, Carnarvon, Flint, Denbigh, Merioneth, Montgomery.
8. = Derby, Nottingham, Leicester, Rutland, Lincoln.
9. = Lancashire, Cheshire.
10. = York.
11. = Northumberland, Durham.
12. = Cumberland, Westmoreland, Isle of Man.
13. = Renfrew, Lanark, Ayr, Dumfries, Kircudbright, Wigton.
14. = Linlithgow, Haddington, Edinburgh, Berwick, Peebles, Selkirk, Roxburgh.
15. = Inverness, Elgin, Banff, Aberdeen, Kincardine, Forfar, Perth, Stirling, Fife.
16. = Skye, Rum, Coll, Tirrez, Mull, Colonsay, Jura, Islay, Argyle, Cantire, Bute, Arran.
17. = Caithness, Sutherland, Cromarty, Ross.
18. = Shetland Isles, Orkney Isles, Hebrides.
19. = Kerry, South Cork.
20. = North Cork, Waterford, South Tipperary.
21. = Kilkenny, Carlow, Queens.
22. = Wexford, Wicklow.
23. = Kildare, Dublin, Meath, Louth.
24. = Limerick, Clare, East Galway.

BOT. PROV.

25. = North Tipperary, Kings, West Meath, Longford.
26. = West Galway, West Mayo.
27. = East Mayo, Sligo, Leitrim, Roscommon.
28. = Fermanagh, Cavan, Monaghan, Tyrone, Armagh.
29. = Donegal.
30. = Down, Antrim, Derry.

In collecting Lichens it is requisite to be furnished with a geological hammer and iron chisels of good temper, to detach thin pieces from the rocks, with the lichens growing thereon, and also with a strong, sharp clasp-knife, or strong oyster-knife, to cut or prize off lichens from the bark of trees or from old palings, &c., and a pocket lens. All that is necessary to preserve such specimens is immediately to fold them in soft paper, to prevent injury from rubbing against each other in carriage home. They require no drying or pressure, and are always in a condition proper for examination. Generally speaking, it will be advisable to collect specimens in dry weather. Rain is apt to swell up the parts of lichens so much as to render them rather difficult to be distinguished from each other in their native localities, and specimens gathered in wet weather will not unfrequently be found destitute of spores, which by the lateral pressure on the asci occasioned by the swelling of the adjacent parts by the moisture have been ejected. The practice which will be found useful is, on return home, to fix the specimens on paper, with strong glue, writing the locality from whence obtained, and then arranging them roughly in genera. This arrangement, leading to the successive examination of several species, or specimens, in any particular genus, will be found to facilitate, by comparison and contrast, their satisfactory determination.

Every lichenist is unfortunately well aware of the great difficulty of preserving specimens of lichens which grow on the earth. Too frequently he finds, on consulting his herbarium, that the earth on which such lichens grew has become dry and crumbled into dust, involving in such disintegration the destruction of the lichen itself, especially when this happens to possess a crustaceous thallus. To remedy this, an effective preparation has been discovered by M. J. M. Norman, of Trömso, Norway. It consists of a solution of isinglass in spirits of wine, such as is used in the preparation of English adhesive plaster, which a chemist informs me is better known as "Prout's Plaster." This composition when liquefied in a vessel plunged into water of the temperature of 25—30° C., is greedily imbibed by the earth on which the lichen grows, and becomes inspissated into a solid gelatine, at a temperature below 15°. The solution may be applied by a camel's-hair pencil until the earth becomes saturated, but care should be taken that the lichen itself be not moistened with it, for otherwise it would become discoloured. When the surface has become dry, the specimen may be submitted to moderate pressure, which, after some days, produces the requisite hardness and tenacity.

The mode of arrangement or preservation in the herbarium must be left to individual taste and convenience. The following may be adopted as practically most convenient. Having individual specimens glued down on small or suitably-sized pieces of paper with their names, localities, collector's name, date of collection, and drawings or notes of spores and internal structure appended, fasten these with small pins on quarto single sheets of good cartridge paper, from which any particular specimen can be readily removed for examination and replaced as occasion requires. These single sheets are then placed in a cover of cartridge paper also of quarto size, and the name of the species written on the left hand corner at the bottom on the outside. These covers, each containing a single species, are enclosed in a quarto cover of thick pasteboard, folded bookwise, marked on the back with the name of the genus, and are kept bookwise on shelves in cabinets, arranged according to the system, and in the larger genera to the sections, adopted in the following work. Reference to any particular specimen is thus readily practicable, even in the most extensive genus, and constant use and practice insensibly and gradually impress on the mind a lasting knowledge of systematic arrangement.

The successful study of lichens is not really so difficult as persons imagine, if only they will bring to the work, careful painstaking observation, delicate manipulation in dissection, and a microscope with a good object-glass of $\frac{1}{4}$ inch focus. The mode of examination which may be adopted is this. Moisten the apothecium with water, then applying a watchmaker's lens to the eye, make, with a sharp surgeon's knife or scalpel, a very thin vertical section through the centre of the apothecium. Place this on the lower glass of a compressor, in a drop of hydrate of potash which assists in loosening the cohesion of the parts, and swells the spores to their proper shape, bring down the upper glass of the compressor with slight pressure, and place the whole under the microscope, increasing the pressure by the screw of the compressor gradually as vision shows to be necessary. A view is thus obtained of the asci, spores, paraphyses, structure, and colour of the hypothecium, &c., and drawings may be made of any of them most readily either with a camera lucida or by throwing the microscope into a horizontal position and placing an oblique steel disk on the end of the eye-piece, on looking through which a picture of the object is thrown on paper and may be traced with a pencil, the extraneous light being excluded by covering the head with a dark-coloured cloth.

If the spores be mature the application of an aqueous solution of iodine will tinge them or the gelatina hymenea blue, or of a red-wine colour, with or without a preceding blue tinge. This re-action occurs only in some lichens, whilst in others there is no such re-action produced, hence it proves useful as a slight confirmatory character. The formula by which the solution is to be prepared is;—Iodine

gr. j.; Iodide of Potash, gr. iij; Distilled water, ½ oz., which must be kept in a glass-stoppered bottle of dark-coloured glass, or covered with tinfoil to exclude light. In using this test, the section of the apothecium must be placed in the iodine solution at once, and not previously in the hydrate of potash, which would nullify the re-action. To test the thallus either on its cortical layer, or in the medulla, hydrate of potash is used, compounded of equal weights of caustic potash and water. Hypochlorite of lime (chloride of lime and water) is another reagent, which may be made of any strength. These are applied by small brushes made of spun glass, one brush being kept exclusively for each reagent, and also a separate vessel used for each. The modus operandi is this: touch the cortical layer or the medulla (exposed by scraping off a morsel of the cortical layer) with the hydrate of potash, and while still moist apply the hypochlorite of lime, and note whether any re-action, and of what kind, results. Sometimes the hydrate of potash produces a distinct yellow tinge, which may be symbolised as (K+) or if only faint as (K f+) This yellow re-action is sometimes persistent (K+), but in other lichens immediately changes to a red colour (K yellow then red). In others the yellow produced by the hydrate of potash is changed into red, or the yellow is deepened, by the immediate application of hypochlorite of lime, symbolised (K yellow C red) or (K yellow, C deep-yellow). Again the hydrate of potash may produce no re-action, but the immediate subsequent application of hypochlorite of lime elicits red or yellow as the case may be, symbolised thus (K – C + red) or K – C + yellow). Sometimes neither reagent produces any re-action and is thus noted (K – C –). A very convenient mode of symbolising the re-action of the cortical layer and medulla of the same lichen is to place the re-action of the former above that of the latter thus (K ∓ = C). These re-actions, which may be generally obtained on any portion of the thallus, are frequently more vivid on the younger or circumferential portions. Success depends on the reagents being freshly compounded and of the proper strength, and temperature has also something to do with it, as in very severe cold weather the re-action takes place very slowly and imperfectly, and perhaps at all times it would be advisable to warm the reagent. Great cleanliness must be observed with the brushes and vessels, which should be thoroughly wiped dry after using. None of the liquid reagent should be left exposed to the air from one day to another, nor a fresh supply added to any which has been so exposed, nor must any which has been once used be returned to the stock bottles, which should always have close fitting glass-stoppers. Neglect of these precautions results in failure and uncertainty. The aqueous solution of iodine is also useful as a test on the exposed medulla in certain cases.

The following work is arranged as to Families, Tribes, and Genera, with some slight modifications, on the system of Dr. W. Nylander, of Paris, as being simple and philosophical, founded on

a general consideration and balancing of all the parts of lichens, their external and internal structure, and as exhibiting their combination with the Algæ and Fungi to which Lichens are intermediate. To facilitate the student's labour in the ready and accurate determination of his specimens, the species, especially in the more extensive genera, such as *Lecanora*, *Lecidea*, *Verrucaria*, *&c.*, have been thrown into small groups, distinguished either by the peculiar external character of the thallus or the forms and colour and septa of the spores, and in the largest genus, *Lecidea*, each of such groups is again subdivided into lesser ones according as the hypothecium is dark or colourless. Objectionable as such an arrangement confessedly is in separating allied species, it is believed it will be nevertheless found convenient and useful. In the diagnoses the prominent and distinguishing characters are printed in italics, and the chemical re-action added as a confirmatory aid. Its general habitat, relative frequency or scarcity, date of first discovery in Britain, (also appended afterwards to the name of its discoverer,) are given. The synonymy has been purposely made concise, retaining only a reference to the work in which each lichen was first described and named, and also to the works of Acharius, the Linnæus of Lichenology; and finally to the various works of Dr. W. Nylander; and to those of humbler students, where necessary. By a reference to these works the synonymy may be, if desired, followed out *in extenso*. References are made to characteristic figures of the lichen, its spores, &c. Micrometric measurements of the spores are also given, from the works of Mudd, Nylander, and T. M. Fries, to which are added my own measurements.

References are made to various published Exsiccati, Continental and British, enumerated hereafter; and in the preparation of the work the Herbaria of Mr. Dawson Turner, Mr. Borrer, and the Hookerian Herbarium at Kew; many original specimens from Acharius; the collections of Dr. Greville, Dr. George Johnston, Mr. Carroll, Mr. Crombie, Mr. Larbalestier, and many others have been consulted and examined, and where necessary microscopically. To which must be also added my own immense Lichen-Herbarium (without exaggeration the finest and most extensive private one, both as to British and Tropical lichens, in the kingdom, and destined at my death to be presented to the National Herbarium at Kew) comprised in 400 quarto cases occupying, bookwise, shelves 120 feet in length. The names of Botanists on whose authority those localities rest are appended, and a note of admiration (!) added where a specimen from any locality has been personally examined. Those localities to which no name is appended have been ascertained by the personal research of the author, and for these he alone is responsible.

The marvellous discoveries of Mr. Larbalestier in the West of Ireland, and the inferior, but very interesting, ones of Mr. Crombie, Dr. Stirton, Mr. McAndrew, Dr. Bainbridge, and

others in the North of Scotland, and of myself in North and South Wales, have raised our Lichen-Flora to an equality in numbers and rarity, with that of any other country in Europe.

The number of species and forms or varieties comprised in the second edition of this work amounted to 1,156, whilst in the present edition they have risen to 1,710, and may be tabulated as follows:—

| Genus. | Species | Var. or Form | Total. |
|---|---|---|---|
| Sirosiphon | 1 | — | 1 |
| Gonionema | 1 | — | 1 |
| Ephebe | 1 | — | 1 |
| Spilonema | 3 | — | 3 |
| Lichina | 2 | — | 2 |
| Pterygium | 2 | — | 2 |
| Leptogidium | 1 | — | 1 |
| Synalissa | 1 | — | 1 |
| Pyrenopsis | 8 | — | 8 |
| Collema | 27 | 16 | 43 |
| Leptogium | 24 | 10 | 34 |
| Collemopsis | 7 | — | 7 |
| Pyrenidium | 1 | — | 1 |
| Myriangium | 1 | — | 1 |
| Sphinctrina | 3 | — | 3 |
| Calicium | 18 | 6 | 24 |
| Coniocybe | 3 | 2 | 5 |
| Trachylia | 3 | — | 3 |
| Sphærophoron | 3 | — | 3 |
| Gomphillus | 1 | — | 1 |
| Bæomyces | 4 | 1 | 5 |
| Pyenothelia | 2 | — | 2 |
| Cladonia | 20 | 28 | 48 |
| Cladina | 4 | 7 | 11 |
| Pilophoron | 2 | — | 2 |
| Stereocaulon | 7 | 4 | 11 |
| Roccella | 3 | 1 | 4 |
| Thamnolia | 1 | — | 1 |
| Usnea | 1 | 7 | 8 |
| Alectoria | 6 | 8 | 14 |
| Evernia | 2 | 2 | 4 |
| Ramalina | 13 | 13 | 26 |
| Cetraria | 3 | 6 | 9 |
| Platysma | 10 | 5 | 15 |
| Nephromium | 3 | 4 | 7 |
| Peltigera | 9 | 4 | 13 |
| Solorina | 4 | — | 4 |
| Stictina | 7 | — | 7 |
| Sticta | 3 | — | 3 |
| Carried forward... | | | 339 |

| Genus. | Species | Var. or Form. | Total. |
|---|---|---|---|
| Brought forward..... | | | 339 |
| Ricasolia | 2 | — | 2 |
| Parmelia | 25 | 30 | 55 |
| Physcia | 17 | 26 | 43 |
| Umbilicaria | 10 | 11 | 21 |
| Psoroma | 1 | — | 1 |
| Pannaria | 13 | 6 | 19 |
| Amphiloma | 1 | — | 1 |
| Squamaria | 6 | 5 | 11 |
| Placodium | 13 | 5 | 18 |
| Lecanora | 123 | 104 | 227 |
| Pertusaria | 28 | 2 | 30 |
| Phlyctis | 2 | — | 2 |
| Thelotrema | 2 | 1 | 3 |
| Urceolaria | 1 | 2 | 3 |
| Lecidea | 397 | 147 | 544 |
| Odontotrema | 2 | — | 2 |
| Schizoxylon | 1 | — | 1 |
| Xylographa | 4 | 2 | 6 |
| Ptychographa | 1 | — | 1 |
| Agyrium | 1 | — | 1 |
| Lithographa | 7 | — | 7 |
| Opegrapha | 29 | 33 | 62 |
| Platygrapha | 1 | — | 1 |
| Stigmatidium | 5 | — | 5 |
| Arthonia | 34 | 17 | 51 |
| Graphis | 10 | 31 | 41 |
| Chiodecton | 1 | 1 | 2 |
| Glyphis | 1 | — | 1 |
| Melaspilea | 4 | — | 4 |
| Mycoporum | 3 | — | 3 |
| Rimularia | 1 | — | 1 |
| Thelocarpon | 4 | — | 4 |
| Normandina | 2 | — | 2 |
| Endocarpon | 4 | 5 | 9 |
| Verrucaria | 157 | 25 | 182 |
| Strigula | 1 | — | 1 |
| Melanotheca | 3 | — | 3 |
| Astrothelium | 1 | — | 1 |
| Total | | | 1710 |

I have purposely omitted any mention of the Schwendenerian Theory of Lichens, as I cannot but regard it as purely imaginary, "the baseless fabric of a vision;" which even if it could be proved to be true, which is not yet the case, cannot make lichens to be less lichens, nor interfere with their systematic study.

It will be well for us ever to bear in mind the sound remarks which Mr. Bentham embodied in 1872 in one of those admirable addresses which, as President of the Linnæan Society, he annually delivered. "There is a very common readiness to take at once as proved any paradox, or theory, opposed to general belief, when

a new discovery appears to afford some plausible argument in its favour. In Lichens, according to Schwendener, we have the supposed parasite surrounding and enclosing its presumed victim, cutting it off from all communication with the outer world from which it has to derive its nutriment; and yet we are to believe that the poor prisoner not only sustains its own life and feeds its hosts, but flourishes, grows, and multiplies. If the hyphæ feed upon the enclosed gonidia, what do the gonidia feed upon? If there really is parasitism in the case, which is very doubtful, may not the gonidia be the parasites, the lichen, the host? or may not the gonidia be mere stages of existence of certain lichens falsely ascribed to Algæ? The whole question is a very curious one, and, notwithstanding the skill and acuteness of Schwendener and others, requires much more observation and study before the conclusions derived from them can be taught as an established theory. And whatever be the result, the group of lichens is so distinct in its vegetative characters, and at the same time so extensive and varied a one, that it seems more methodical to treat it, as heretofore, as a distinct class, than to absorb it in that of fungi, notwithstanding the close affinity shown by its reproductive organs."

Should the student desire to possess microscopical preparations of sections of the thallus, spores, &c., of lichens, I can confidently refer him to my friend, the Rev. J. E. Vize, Forden Vicarage, near Welshpool, Montgomeryshire, whose slides, prepared with great scientific knowledge and skilful manipulation, are unrivalled, and cannot be surpassed for beauty and usefulness.

Mr. E. M. Holmes, F.L.S. (30 Arthur Road, Holloway, London N.), and Mr. W. Joshua, F.L.S. (Cirencester), are also doing great service to practical science in issuing fasciculi of microscopical preparations (in slides) of sections of the thallus, spores, &c., which will enable the student to attain a more thorough and adequate knowledge of internal structure. The examples I have seen are most beautiful and excellent, and are deserving of the highest commendation.

I take this opportunity to make known that my friend, Mr. Larbalestier proposes to publish under the title of "LARBALESTIER'S LICHEN-HERBARIUM" a series of dried Lichens of Ireland, England, and the Channel Islands, four fasciculi of which will be issued each year, each containing 40 species, nearly all rare or little known plants, at 12/6 each fasciculus. Mr. Larbalestier also intends to issue fasciculi of "LICHENES RARISSIMI" at 20/- each, independent of the above.

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THE

# LICHEN-FLORA

OF

# GREAT BRITAIN, &c.

## CLASS OF LICHENS.

Thallus furnished with a stratum of gonidia or granula gonima variously disposed, very often (at least in the crustaceous species) containing crystals of oxalate of lime. Fructification consisting of spores in thecæ or asci; gelatina hymenea in most species becoming blue, in others reddish, on the application of an aqueous solution of iodine. Spermogonia in pyrenodine conceptacles distinct from the apothecia, and occurring either generally on the same thallus with the apothecia *(monœcious)*, or sometimes separately on different thalli *(diœcious)*.

Lichens are distinguished from Fungi by the peculiar type, form and structure of the thallus. The families and their principal subdivisions are chiefly based on the diversities of the thallus, though sometimes the differences of the apothecia and spermogonia determine these.

Thallus byssaceous. = Family I. BYSSACEI.
Thallus gelatinous. = Family II. COLLEMACEI.
Thalamium cellulose, with superimposed theciferous cavities = Family III. MYRIANGIACEI.
Thallus not gelatinous. = Family IV. LICHENACEI.

### FAM. I. BYSSACEI.

Thallus byssaceous; granula gonima in a thalline vagina. = Tribe I. SIROSIPHEI.

### FAM. II. COLLEMACEI.

Thallus filiform, branched. = Tribe I. LICHINEI.
Thallus membranaceous, lobate. = Tribe II. COLLEMEI.

### FAM. III. MYRIANGIACEI.

Thalamium cellulose, with superimposed theciferous cavities. = Tribe I. MYRIANGIEI.

## FAM. IV. LICHENACEI.

Spores pulverulent on surface of fructification. = Series I. EPICONIODEI.

Thallus foliolose; apothecia terminal on podetia, biatorine. = Series II. CLADODEI.

Thallus efoliolose, fruticulose or filamentose; apothecia lecanorine. = Series III. RAMALODEI.

Thallus foliaceous, depressed, lobed. = Series IV. PHYLLODEI.

Thallus crustaceous, squamose, radiate, granulose, powdery, or evanescent. = Series V. PLACODEI.

Fructification in closed receptacles. = Series VI. PYRENODEI.

### SERIES I. EPICONIODEI.

Thallus horizontally expanded; apothecia stipitate, cupuliform, or sessile. = Tribe I. CALICIEI.

Thallus fruticulose, ramose; apothecia nucleiform. = Tribe II. SPHÆROPHOREI.

### SERIES II. CLADODEI.

Thallus horizontal; apothecia substipitate. = Tribe III. BÆOMYCEI.

Thallus foliaceous; apothecia biatorine on scyphiform or simple podetia. = Tribe IV. CLADONIEI.

Thallus cæspitose, podetiiform; apothecia terminal or lateral, lecideine. = Tribe V. STEREOCAULEI.

### SERIES III. RAMALODEI.

Thallus branched, white; apothecia lateral. = Tribe VI. ROCCELLEI.

Thallus podetiiform; apothecia unknown. = Tribe VII. SIPHULEI.

Thallus branched, terete, or compressed, medullary axis firm; apothecia peltate. = Tribe VIII. USNEEI.

Thallus branched, round or compressed, medullary axis woolly; apothecia lateral or terminal. = Tribe IX. RAMALINEI.

Thallus compressed, fruticulose or membranously dilated; apothecia marginal. = Tribe X. CETRARIEI.

### SERIES IV. PHYLLODEI.

Apothecia peltiform. = Tribe XI. PELTIGEREI.

Apothecia marginal, on under side of thallus. = Sub-tribe 1. NEPHROMEI.

Apothecia marginal, on upper side of thallus. = Sub-tribe 2. PELTIDEI.

Apothecia not marginal, innate. = Sub-tribe 3. SOLORINEI.

Apothecia lecanorine. = Tribe XII. PARMELIEI.

Thallus membranaceo-lobate, tomentose and cyphellate beneath; spores fusiform, 1–3–septate; paraphyses distinct. = Sub-tribe 1. STICTEI.

Thallus laciniato-lobate; spores ellipsoid, simple; paraphyses indistinct. = Sub-tribe 2. IMBRICARIEI.

Thallus stellato-orbicular; spores bilocular; paraphyses distinct. = Sub-tribe 2. PHYSCIEI.

Apothecia lecideine, gyrose. = Tribe XIII. GYROPHOREI.

## SERIES V. PLACODEI.

Apothecia lecanorine. = Tribe XIV. LECANOREI.

Thallus squamulose, gonidia large, distinct. = Sub-tribe 1. PSOROMEI.

Thallus squamulose or granulose, with granula gonima (no gonidia). = Sub-tribe 2. PANNARIEI.

Thallus pulverulent. = Sub-tribe 3. AMPHILOMEI.

Thallus radioso-laciniate or cartilagineo-squamose; spores ellipsoid, simple. = Sub-tribe 4. SQUAMARIEI.

Thallus radiate (not radioso-laciniate); spores ellipsoid, bilocular, cells united by a longitudinal tube. = Sub-tribe 5. PLACODEI.

Thallus crustaceous, granulose; spores simple or variously septate. = Sub-tribe 6. EULECANOREI.

Apothecia endocarpoid, enclosed in verrucæ of thallus; spores very large, ellipsoid. = Sub-tribe 7. PERTUSARIEI.

Apothecia in thalline verrucæ, but with an open epithecium; spores plurilocular or murali-divided. = Sub-tribe 8. THELOTREMEI.

Apothecia biatorine or lecideine or gyalectine. = Tribe XV. LECIDEINEI.

Apothecia lirelline. = Tribe XVI. GRAPHIDEI.

Hymenia covered by a black rimuloso-dehiscent peridium. = Tribe XVII. PERIDIEI.

## SERIES VI. PYRENODEI.

Apothecia pyrenodine. = Tribe XVIII. PYRENOCARPEI.

## FAM. I. BYSSACEI.

### TRIBE I. SIROSIPHEI.

Thallus cæspitose, distinctly vaginate. = SIROSIPHON.

Thallus cæspitose, granula gonima concatenate into a central axis; apothecia biatorine. = GONIONEMA.

## FAM. II. COLLEMACEI.

### TRIBE 1. LICHINEI.

Thallus cæspitose, granula gonima in transverse strata; apothecia lecideine. = SPILONEMA

Thallus fruticulose, granula gonima connate in transverse strata; apothecia endocarpoid in swellings of the thallus. = EPHEBE.

Thallus fruticulose, fucoid, granula gonima cærulescent; apothecia in terminal globose receptacles. = LICHINA.

Thallus appressed; granula gonima moniliformi-concrete; apothecia lecideine. = PTERYGIUM.

Thallus fruticulose; granula gonima moniliformi-concatenate; apothecia lecideine. = LEPTOGIDIUM.

### TRIBE 2. COLLEMEI.

Thallus granulato-areolate, internally rubricose, granula gonima in globular cells; apothecia urceolato-innate; spores simple. = PYRENOPSIS.

Thallus granulose or fruticulose, granula gonima in globular cells; apothecia innate, lecanorine or endocarpoid; spores simple. = SYNALISSA.

Thallus without cortical layer, granula gonima moniliform; apothecia lecanorine; spores multilocular, rarely simple. = COLLEMA.

Thallus with distinct cortical layer, granula gonima moniliform; apothecia lecanorine; spores multilocular, rarely simple. = LEPTOGIUM.

Thallus internally green; granula gonima submoniliform; apothecia subgyalectoid. = COLLEMOPSIS.

Thallus minute, stellato-divided, or cæspitellose, or confluento-effuse; apothecia pyrenocarpous, verrucarioid. = PYRENIDIUM.

## FAM. III. MYRIANGIACEI.

### TRIBE I. MYRIANGIEI.

Thalamium cellulose, with superimposed theciferous cavities. = MYRIANGIUM.

## FAM. III. LICHENACEI.

### SERIES I. EPICONIODEI.

### TRIBE I. CALICIEI.

Thallus none; apothecia parasitic on *Pertusariæ* globoso-turbinate, subsessile, black; spores nigrescent, simple. = SPHINCTRINA.

Thallus granuloso-pulverulent; apothecia globoso-turbinate, stipitate, black; spores nigro-fuscous, simple or 1-septate. = CALICIUM.

Thallus pulverulent; apothecia globoso-pulverulent, stipitate, yellow; spores colourless. = CONIOCYBE.

Thallus granulose; apothecia cupuliform, sessile, black; spores nigricant, 1-septate. = TRACHYLIA.

### Tribe II. Sphærophorei.

Apothecia terminal, nucleiform, globose, irregularly dehiscent; spores sphærical, violet-black. = Sphærophoron.

## Series II. CLADODEI.

### Tribe III. Bæomycei.

Thallus gelatinoso-conglutinate; apothecia stipitate clavato-capitate; spores filiform, multiseptate. = Gomphillus.

Thallus crustaceo-granulose or subsquamulose; apothecia stipitate or sessile, biatorine. = Bæomyces.

### Tribe IV. Cladoniei.

Thallus foliolose, or squamulose, or granuloso-crustaceous; podetia fistulose, laciniato-ramose or scyphose; apothecia terminal, biatorine, livido-fuscous or scarlet. = Cladonia.

Thallus verrucoso-granulate, bearing large fuscescent sessile cephalodia; podetia rigid, simple, minute; apothecia terminal subglobose, black. = Pilophoron.

### Tribe V. Stereocaulei.

Podetia covered with variously-shaped fragile granules; apothecia fuscous; spores cylindraceo-fusiform, 3-9-septate; cephalodia verrucoso-glomerulose. = Stereocaulon.

## Series III. RAMALODEI.

### Tribe VI. Roccellei.

Thallus fruticulose, from a common base, terete or compressed; spores oblong or fusiform, 3-septate. = Roccella.

### Tribe VII. Siphulei.

Thallus of prostrate subulate stipites, acute at the apices, fistulose. = Thamnolia.

### Tribe VIII. Usneei.

Thallus filamentose, pale cinereo-virescent; apothecia concolorous. = Usnea.

### Tribe IX. Ramalinei.

Thallus cylindrical, horny; spores simple. = Alectoria.
Thallus applanate, flaccid; spores simple. = Evernia.
Thallus compressed, rigescent; spores 1-septate. = Ramalina.

### Tribe X. Cetrariei.

Thallus spadiceous, laciniose or fistulose. = Cetraria.

Thallus various in colour, membranaceo-dilatate and lobate. = Platysma.

## Series IV. PHYLLODEI.

### Tribe XI. Peltigerei.

#### Sub-tribe I. Nephromei.

Cortical layer continuous on the nerveless lower surface of the thallus; spores septate. = Nephromium.

#### Sub-tribe II. Peltidei.

Cortical layer not continuous on the nerved and rhizinose lower surface of the thallus; spores 3-5-7-septate. = Peltigera.

#### Sub-tribe III. Solorinei.

Cortical layer not continuous on the obsoletely-nerved lower surface of the thallus; spores 1-septate. = Solorina.

### Tribe XII. Parmeliei.

#### Sub-tribe I. Stictei.

Gonidial stratum of the thallus consisting of glauco-virescent or glauco-cærulescent granula gonima in pluri-locular nodules. = Stictina.

Gonidial stratum of the thallus consisting of free, true, bright or yellow-green gonidia; rhizinæ simple. = Sticta.

Under surface of thallus with fasciculate rhizinæ; spores 1-3-septate. = Ricasolia.

#### Sub-tribe II. Imbricariei.

Spores simple. = Parmelia.

#### Sub-tribe III. Physciei.

Spores polari-bilocular or 1-septate. = Physcia.

### Tribe XIII. Gyrophorei.

Thallus monophyllous, umbilically affixed. = Umbilicaria.

## Series V. PLACODEI.

### Tribe XIV. Lecanorei.

#### Sub-tribe I. Psoromei.

Gonidial stratum of thallus consisting of large distinct gonidia. = Psoroma.

### Sub-tribe II. Pannariei.

Gonidial stratum of thallus consisting of granula gonima. = Pannaria.

### Sub-tribe III. Amphilomei.

Thallus white, granuloso-pulverulent. = Amphiloma.

### Sub-tribe IV. Squamariei.

Spores simple. = Squamaria.

### Sub-tribe V. Placodei.

Spores polari-bilocular. = Placodium.

### Sub-tribe VI. Eulecanorei.

Apothecia internally colourless; spores 8 or numerous, simple or variously divided, colourless or fuscous. = Lecanora.

Apothecia tuberculoso-lecanorine; hypothecium black; spores fusiform, 3-septate. = Dirina.

### Sub-tribe VII. Pertusariei.

Apothecia endocarpoid, or lecanoroid or variolaroid; spores 1-2-4-8, simple, very large, ellipsoid, with a thick episporium. = Pertusaria.

Apothecia erumpent, rotundato-difformed; spores 1-2, murali-divided. = Phlyctis.

### Sub-tribe VIII. Thelotremei.

Apothecia verrucæform, open; spores 8, murali-divided. = Thelotrema.

Apothecia urceolate; spores murali-locu'ar. = Urceolaria.

### Tribe XV. Lecideinei.

Thallus crustaceous, squamose, scurfy, powdery, granulate, areolate, continuous, rimulose, or evanescent; spores 8 or numerous, colourless or fuscous, simple or variously septate. = Lecidea.

Thallus evanescent; apothecia gymnotremoid, naked, black; spores 3-septate. = Odontotrema.

Thallus evanescent; apothecia lecideine, elevated, naked, black; spores numerous. = Schizoxylon.

### Tribe XVI. Graphidei.

Apothecia black, linear, parallel, plane, internally cinerascent; spores 8, simple. = Xylographa.

Apothecia prominent, with 2 or 4 longtitudinally parallel hymenia in each; spores 8, simple. = PTYCHOGRAPHA.

Apothecia red, rotundate or oblong, biatorine, plane, internally colourless; spores 8, simple. = AGYRIUM.

Apothecia black, tumid; hypothecium black, entire; spores 8 or numerous, simple or 1-septate. = LITHOGRAPHA.

Apothecia black, superficial; perithecium black, entire; spores 8, obovate or fusiform, 1-multiseptate; paraphyses indistinct. = OPEGRAPHA.

Apothecia black, impressed in thalline verrucæ and surrounded with a spurious thalline margin; hypothecium black; spores fusiform, 3-septate = PLATYGRAPHA.

Apothecia brownish, punctiform or elongate, immersed; hypothecium colourless. = STIGMATIDIUM.

Apothecia roundish, plane, or tumid, innately sessile; asci pyriform in excavations of the subgelatinous hymenium; paraphyses none = ARTHONIA.

Apothecia black, innate or immersed; spores 8, oblong or lineari-elongate or cylindrical, pluri-locular; paraphyses distinct. = GRAPHIS.

Apothecia substellato-radiate, immersed in white rounded verrucæ; spores fusiform, 3-septate. = CHIODECTON.

Apothecia intricato-flexuose, immersed in white plano-depressed verrucæ. = GLYPHIS.

Apothecia black, superficial, arthonoid; spores 1-septate; paraphyses distinct. = MELASPILEA.

### TRIBE XVII. PERIDIEI.

Apothecia containing many hymenia conjoined as in a common excipulum, but without perithecia. = MYCOPORUM.

Apothecia rotundate, depressed in the centre, dehiscing by a subradiate fissure. = RIMULARIA.

## SERIES VI. PYRENODEI.

### TRIBE XVIII. PYRENOCARPEI.

Apothecia single in citrine sphærical thalline verrucæ; spores numerous. = THELOCARPON.

Perithecia black, immersed in a squamulose thallus; spores 8. septate. = NORMANDINA.

Perithecia pale, immersed in a peltate or squamæform thallus; spores 8, simple. = ENDOCARPON.

Perithecia black, rarely coloured, entire or dimidiate, semi-immersed or sessile; spores 8 or numerous, simple or variously septate. = VERRUCARIA.

Foliicolous. = STRIGULA.

Perithecia numerous, minute, black, imbedded in a round or oblong blackish plane apothecium. = MELANOTHECA.

Perithecia several, stellato-congregate, their ostiola converging into one common central poriform epithecium. = ASTROTHELIUM.

## FAM. I. BYSSACEI.

Thallus black or fuscous, filamentose, byssoid; granula gonima in 1-2 or 3 series enclosed in a vagina.

### TRIBE I. SIROSIPHEI.

Thallus minute, filamentose, densely implexed or compacted, vaginate, granula gonima in 1–2–3 series.

### I. SIROSIPHON. *Ktz.*

Filaments branched, distinctly vaginate, composed of gelatinous cellules, each enclosing a solid gonimic nucleus, arranged in simple or 2-3-fold series within the vagina.

1. *S. compactus*, Ktz. black, densely intricate, filaments ascending, rigid, curved, coalescent below, vagina cartilagineo-corneous, fuscous; cellules in single series.

On rocks, frequent. 1876.

SYN :—Kutzing Sp. Algarum, 316. (1849).
FIG :—Hassall Algæ, t. 68. f. 3.
GEOG. DISTRIB :—Europe.
BOT. PROV :—26.
IRELAND :—Rocks south side of Kylemore Lake, co. Galway, *Mr. Larbalestier.* (1876.)

### II. GONIONEMA. *Nyl.*

Thallus filiform, granula gonima concatenated into a single central axis. Apothecia concolorous, biatorine. Spermatia minutely oblong, simple.

I. G. *velutinum*, Nyl. dark-brown, slender, entangled; apothecia dark-brown, terminal, centre depressed, margin swollen, pale within; spores 8, colourless, ellipsoid, simple; paraphyses slender.

On sub-alpine rocks rare. 1864.

SYN :—Nyl. Prodr. 16 (1857); Syn. 88; Scand. 23; *Collema*, Ach. Syn. 329.
FIG :—Ann. and Mag. Nat. Hist. July 1865, t. 4, f. 1, 2, 3, 4, 5, 6: Nyl. Syn. t. 1, f. 11.
EXS :—Arn. 571. Lojka. 1590. Smrft. 71. Reich. & Schub. 69.
GEOG. DISTRIB :—Europe, Scandinavia, France.
BOT. PROV :—1 . 7.
ENGLAND :—St. Cleere near Liskeard, *Messrs. Turner & Sowerby.*
WALES :—Barmouth! Craig Breidden! (northern precipices) Montgomeryshire (1864); Snowdon! Cwm Bochlwyd! Cwm Idwal! Cwm Cywion! Aran Mowddy!

"Gelatina hymenea I. blue, then vinous-red. Spores .009—.010 mm. long, ·007 mm. broad." *(Nyl.)* Spores .013—.014 mm. long, .007 mm. broad.

## FAM: II. COLLEMACEI.

Thallus black, fuscous, dark olive, rarely cinerascent or glaucescent, variable in form; granula gonima either moniliform or variously dispersed in the gelatinous substance of the thallus. Apothecia generally lecanorine, rarely biatorine, rarely endocarpoid, generally rufescent, rarely black, internally whitish or pale,

## Tribe I. Lichinei.

Thallus small or minute, filiform, cæspitoso-fruticulose, or depresso-implexed; granula gonima moniliform, connate, or variously concrete. Apothecia lecanorine, biatorine or lecideine or endocarpoid. Spores 8, colourless.

### I. EPHEBE. *Fr. Born. Nyl.*

Thallus filiform, branched, fruticulose; granula gonima large, subtransversely arranged in little heaps, 2, 4, or more together. Apothecia endocarpoid, in thickened portions of the thallus. Spermatia straight, cylindrical.

1. *E. pubescens*, Fr. blackish-brown, slender, cæspitose, entangled, branched, slightly rugulose; spores 8, colourless, lineari-oblong or subfusiform, 1-septate; paraphyses indistinct.

On subalpine rocks, not unfrequent. 1851.

Syn:—Fries S.O.V. 256 (1825); Bornet in Ann. Sc. Nat. ser. 3. xviii, 170; Nyl. Prod. 17, Syn. 90, Scand. 24. *Lichen exilis*, Lightf. Fl. Scot. p. 894, teste Herb. Pulteney, &c. in Mus. Brit.

Fig:—Ann. Sc. Nat. l. c. t. 7. Ann. and Mag. Nat. Hist. July, 1865, t. 4, f. 12, 13, 14. Nyl. Syn. t. 2, f. 1 & 17—20.

Exs:—Nyl. 1. M. & N. 358. Hepp. 712. Fellm. 2.

Geog. Distrib:—Scandinavia, E. Lapland, France, Switzerland, Algeria Greenland, N. America.

Bot. Prov: 1...7...11...15...16...19...23...26.

England:—Dartmoor! *Mr. Ralfs.* South Devon. *Rev. J. M. Crombie.* Eglestone, Durham. *Rev J. Harriman.* In the River Erme above Ivy Bridge, Devon. *Dr. Holl.* Blackstone Rock, Dartmoor. *Mr. Parfitt.*

Scotland.—Loch Awe; Achallater, Braemar; Craig Guie; *Rev J. M. Crombie.*

Ireland:—Glengariff, Coachford! west of Cork. *Mr. Carroll.* Dublin Mountains. *Mr Archer.* Loch Leane and Cromaglan, Killarney. *Dr. Carrington.* Kylemore! co. Galway. *Mr. Larbalestier.*

Wales.—Summit of Pen-maen-mawr!; (1851) Barmouth! Glyder Vach!, Cwm Bochlwyd! Pass of Llanberis!

Consult Grevillea, 5. 124. "Spores .011—16 mm. long, .003—4 mm. broad." *(Nyl.)* Spores .013—.014 mm. long, .0035 mm. broad.

### II. SPILONEMA. *Born.*

Thallus filiform, branched, fruticulose, granula gonima large, in transverse strata. Apothecia lecideine, lenticular. Spermatia shortly cylindrical.

1. *Sp. paradoxum*, Born. blackish-brown, slender, *cæspitose, entangled*, branched; apothecia black, terminal, hemispherical, immarginate; *hypothecium nigrescent; spores* 8, colourless, oblong, *simple;* paraphyses thick, articulate.

On maritime rocks, rare. 1856.

Syn:—Bornet in Mém. Cherb. Dec. 1856, p. 4; Nyl. Prodr. 17; Syn. 89; Scand. 23. Mudd Man. 35.

Fig:—Mém. Cherb. l. c. t. 1 & 2; Ann. & Mag. Nat. Hist. July 1865. t. 4, f. 7, 8, 9, 10, 11; Nyl. Syn. t. 2, f. 3.

Exs:—Leight. 347.

Geog. Distrib:—France, Pyrenees, Finland.

Bot. Prov:—7...16.

Scotland:—Appin. *Rev J. M. Crombie.*

Wales:—Rocks near Harlech Turnpike, Barmouth! (1856); Glyder Vach! Snowdonia; Llyn Cae! Cader Idris, Cwm Cywion! Cwm Fynnon lloer!

Attention to the regular transverse arrangement, grouping and size of the granula gonima will distinguish this from *Ephebe pubescens* which it generally resembles.

"Spores .009 mm. long, .004 mm. broad. Gelatina hymenea I. intense blue then dusky violet." *(Nyl.)* Spores .009 mm. long, .004 mm. broad.

2. *Sp. revertens*, Nyl. black or fuscous-black, *effuse, minutely coralloideo-compact*, more generally *forming small verrucose pulvinuli*, more or less crowded; *apothecia* black, *lecideine, adnate*, somewhat convex, immarginate, internally entirely obscurely cinerascent; *spores* 8, colourless, *oblong, simple*, the thin lamina of the apothecium somewhat cærulescent; epithecium black, *paraphyses thickish*, their apices incrassate denigrate; *hypothecium not obscurate;* gelatina hymenea I. blue, the apices of the thecæ more intensely tinged.

On granitic and micaceo-schistose rocks, rare. 1863.

SYN :—Nyl. in Flora 1865 p. 601.
GEOG. DISTRIB :—Finland, Eastern Lapland.
BOT. PROV .—15.
SCOTLAND :—Ben Lawers and Craig Tulloch (but only in sterile state, therefore uncertain). *Rev J. M. Crombie* (1863).

"On the thallus occur minute colourless immersed globose pycnides with curved stylospores. Spores .003—.011 mm. long, .005—6 mm. broad." *(Nyl.)*

3. *Sp. Scoticum*, Nyl, black or fuscous, *effuse, minutely coralloid, in small compact verrucose pulvinuli;* apothecia black, minute; epithecium impressed or somewhat convex; *hypothecium colorless; spores* 8, colourless, oviformi-oblong, 1-*septate;* paraphyses slender, distinct; gelatina hymenea tinged blue, the asci violet, by iodine.

On alpine micaceo-schistose rocks, rare. 1869.

SYN :—Nyl. in Flora 1869, p. 82; Crombie En. 1.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie.* (1869).
"Spores .010—14 mm. long, .0045 mm. broad." *(Nyl.)*

## III. LICHINA. *Ag.*

Thallus fuscous-black, fruticulose, firm, granula gonima cærulescent. Apothecia terminal in globose thalline receptacles, lecanorine, subpyrenoid. Spores 8, colourless, ellipsoid, simple. Spermatia oblong.

1. L. *pygmæa*, (Lightf.) cæspitose, ramose, small, *compressed upwards.*

On maritime rocks, not unfrequent. 1777.

SYN :—*Fucus pygmæus*, Lightf. Fl. Scot. p. 964 (1777) *Lichina*, Agardh. Syn. 9, (1817); Nyl. Syn. 91, Scand. 24, Mudd Man. 33.
FIG :—E. Bot. t. 1332. Grev. Scott. Crypt. t. 219. Tulasne Mem. Lich. t. 9, f. 1-6. Ann. and Mag. Nat. Hist. July, 1865, t. 4, f. 21. Nyl. Syn. t. 2, f. 16. Lightf. l. c. t. 32.
EXS :—Leight. 260. Hepp 423. Larbal. 51.
GEOG. DISTRIB :—Europe, Scandinavia, Chili.
BOT. PROV :—1...6...10, 11. .14...18...23...26.. 30, 31.
ENGLAND :—Cornish Coast; Devonshire; Dorsetshire; *Sir J. E. Smith.* Mount's Bay! Cornwall. *Mr. Ralfs.* Torquay! Devon. *Dr. Deakin.* Cullercoats Pier, Northumberland. *Mr. Baker.* Huntcliff, Cleveland. *Mr. Mudd.* Rocks near Shaldon, Babbicombe, Torquay. *Mr. Parfitt.*
SCOTLAND :—Leith and Newhaven; Hebrides, *Sir J. E. Smith.* Isles of Jura, Iona, Firth of Forth, *Rev. J. Lightfoot.* (1777).

IRELAND:—Maritime rocks. *Mr. Carroll.* Ardglass co. Down. *Dr. Maingay.* Dublin. *Dr. Moore.* Mullaghglass! Galway. *Mr. Larbalestier.*

WALES:—Caswell Bay! Mumbles.

CHANNEL ISLANDS:—Coast of Jersey; Shores of Serk, Herm, and Jethou! *Mr. Larbalestier.*

Spores .002—29 mm. long, .011—16 broad. "Spores .005 in. long, by .0025 in. broad." *(Mudd.)* "Spores .026 mm. long, .012 mm. broad." *(Nyl.)* Epispore narrow.

2. L. *confinis*, (Ach). densely caespitose, very small, *round, not compressed.*

On maritime rocks, not unfrequent. 1813.

SYN.—*Lichen confinis*, Ach. Prod. 208. (1798). *Lichina*, Agardh. Spec. 105. (1832); Nyl. Syn. 92. Scand. 24. Mudd Man. 34.

FIG:—E. Bot. t. 2575. Grev. Scott. Crypt. t. 221. Tul. Mem. Lich. t. 10, f. 12, 18. Ann. & Mag. Nat. Hist. July, 1865, t. 4, f. 22.

EXS: Larbal. l. Rabh. 782.

GEOG. DISTRIB:—Europe. Scandinavia, France, Spain, Portugal, Faroe Islands.

BOT. PROV:—1...6, 7...15...19...23...30, 31.

ENGLAND:—Mounts Bay! Cornwall. *Mr. Ralfs.* Whitesand Bay, Cornwall. *Dr. Holl.*

SCOTLAND: Kincardine, Eastern coasts from Firth of Forth northwards. *Rev. J. M. Crombie.*

IRELAND:—Kenmare river, *Sir T. Gage.* (1813). Co. Down. *Dr. Maingay,* near Cork. *Mr. Carroll.* Dublin. *Dr. Moore.*

WALES:—Brocastle, Glamorgan. *Dr. Holl.* Black Stones, Conway Bay! Gimlet Rock! Pwllheli. Y Figle fawr near Barmouth! Caswell Bay! Mumbles. Goodwick Bay! Pembrokeshire.

CHANNEL ISLANDS; South Coast of Jersey! *Mr. Larbalestier.*

Spores .0195 mm. long, .014 mm. broad. Epispore broad.

## IV. PTERYGIUM. *Nyl.*

Thallus appressed, laciniato-multifid, very fragile, in section polished; granula gonima often moniliformi-concrete, principally arranged under the cortical layer (see Nyl. Syn. t. 2. f. 11, 12, & 13). Apothecia lecideine. Spermogonia having long arthrosterigmata (see Nyl. l. c. t. 2. f. 14 & 15).

1. *Pt. pannariellum*, Nyl. *nigrescent, microphyllino-coralloid,* decumbent, granula gonima generally moniliformi-concatenate; *apothecia lecideine, margined with a black annular excipulum; spores* 8, colourless, oblong, 2-3-septate.

On limestone rocks, very rare.

SYN.:—Stizb. Lich. Hyperb. p. 25 note. *Pannaria triseptata*, Nyl. *Lecothecium rosulans*, Th. Fr.

BOT. PROV:—15.

SCOTLAND.—Craig Tulloch, Blair Athole, Perthshire, *Rev. J. M. Crombie.*

2. *Pt. Lismorense*, Cromb. *nigricant, or olivaceo-nigricant, subfurfuraceous, thin,* slightly or obsoletely *radiose,* variously confluent; *apothecia black, lecideine,* small, margined, internally dark; *hypothecium violascenti-nigricant;* epithecium cerulescenti-nigrescent; spores 8, colourless, oviform, 1-*septate.*

On calcareous maritime rocks. 1876.

SYN:—Crombie in Grevillea 5. p. 108 (1877). Nyl. in Flora 1877 p. 221.

BOT. PROV:—16.

SCOTLAND:—Island of Lismore, Argyleshire. *Rev. J. M. Crombie* (1876).

Allied to *Pt. aspersellum* (Ach.) Nyl., but differs in the thallus and spores. Spores .010—11 mm. long, .005.6 mm. broad. Gelatina hymenea I blue, then dusky lutescent.

## V. LEPTOGIDIUM, *Nyl.*

Granula gonima moniliformly concatenated. "Syngonimia scytonemoid."

1. *L. dendriscum*, Nyl, *virescent*, towards the base *flavo-pallescent*, opake, *round*, *or* obsoletely somewhat *compressed*, excessively *branched*, slender, small, *forming intricate fruticuli ; apothecia pale or pale-rufous*, smallish ; epithecium at length somewhat convex ; *spores* 8, *colourless*, *ellipsoid*, *simple ;* gelatina hymenea I blue.

On mossy trees on lofty mountains, rare. 1861.

SYN :—Nyl. Pyren. Or. 48. Nyl. Syn. 135. *L. Moorei*, Leight. Lich. Fl. 2nd ed. p. 27.
FIG :—Trans. Bot. Soc. Edinb. 7. t. 10. f. 2.
GEOG. DISTRIB : Brazil, Isle of Bourbon, Papéiti and New Caledonia.
BOT. PROV :—19. 20.
IRELAND :—Glena, Killarney, *Dr. Carrington.* (1861). Glengariff ! *Adm. Jones.*
Crombie, in Journ. Bot., says, "On submitting a specimen of *Leptogium Moorei*, Hepp. to Nylander he pronounced it to be entirely the present species. In all the specimens which I have seen in herb. Carroll & ex herb. Jones, there are no apothecia present, and it is most likely that the anomalous apothecia hitherto described were simply spermogones, though even these, which are not unfrequent in the specimens referred to, are scarcely rightly developed. This is another of those interesting exotic species which find their way to S.W. Ireland."

### TRIBE II. COLLEMEI.

Thallus very various, crustaceous, granulose or lobate, laciniate or microphylline ; granula gonima glaucous-green either moniliform or variously dispersed. Apothecia lecanorine or biatorine or endocarpoid.

## I. SYNALISSA. *DR. Nyl.*

Thallus nigricant, minute, of various form, thinly incrusting, submembranaceous, granulose, fruticuloso-divided, granula gonima in globular cells ; apothecia innate, concolorous, lecanorine or endocarpoid. Spermatia oblong.

1. *S. symphorea*, (DC.) *black*, *fastigiato-divided*, branches terete, obtuse, *sometimes* only *noduliform ; apothecia terminal*, concolorous, *punctiformi-impressed*, at length dilated, *thalline margin tumid ;* spores 8-24, colourless, ellipsoid or sphærical, simple.

On maritime calcareous rocks, rare.

SYN.—*Collema*, DC. Fl. Fr. 2. 388. *Collema synalissum*, Ach. L. U. 640. Syn. 317. *Synalissa*, Nyl. Syn. 94. Mudd Man. 35.
FIG :—Hepp Sporen t. 11, f. 89. Nyl. Syn. l. c. t. 3. f. 2.
EXS :—Zw. 366. Hepp 89. Anzi It. S. 1, Anzi Venet. 6.
GEOG. DISTRIB :—Central Europe, France, Pyrenees, Germany, Italy, Algeria.
BOT. PROV :—1. 25.
ENGLAND :—St. Vincent's Rocks, near Bristol. *Dr. Thwaites.* Baddicombe, Devon. *Adm. Jones.*
Gelatina hymenea I.—"Spores .009—.012 mm. long, .006—9 mm. broad." *(Nyl.)* "Spores .00125 in. diam. (*Mudd* t. 1. f. 2)."

## II. PYRENOPSIS. *Nyl.*

Thallus crustaceous, thin, granuloso-areolate, laxly cellulose, internally rubricose, granula gonima agglomerated in globular cells. Apothecia concolorous, minute, urceolato-innate in a prominent margined receptacle, margin somewhat swollen and connivent. Spores simple.

1. P. *hæmatopis*, (Smrft.) *dark or rubricoso-fuscous*, crustose, opake, *verrucoso-unequal*, *thickish*, *diffract*, internally subconcolorous or more nigricant in the lower portion; spermatia very minute, ellipsoid; *apothecia superficial*, *urceolate*, *margins elevated*, *entire*; spores 8, colourless. ellipsoid, simple.

On alpine rocks, rare. 1865.

SYN :—Smrft. Lapp. 117. (1829). Nyl. Lapp. or. 104. Crombie En. 2.
EXS :—Fellm. 5.
GEOG. DISTRIB :—Lapland.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Adm. Jones* (1865).

3. *P. homœopsis*, Nyl. *brown*, thin effuse, *subgranulose*; *apothecia* concolorous, *lecanorine*, small, internally pale; epithecium colourless; paraphyses slender; spores 8, colourless, ellipsoid, simple; gelatina hymenea vinous-red with iodine.

On micaceous boulders, rare. 1867.

SYN :—Nyl. in Flora, 1868. p. 342. Crombie in Seeman Journ. Bot. 7. 48. (1869).
BOT. PROV :—15.
SCOTLAND —Loch-na-cat, Ben Lawers. (1867) *Rev. J. M. Crombie*
Allied to *P. grumulifera*, Nyl. but distinct.
"Spores .011—18 mm. long, .007—10 mm. broad." *(Nyl.)*

4. *P. fuscatula*, Nyl, *darkly fuscous or brown-black*, minute, *noduloso-granulate*, effuse, granules *agglomerate* and confluent *in depressed glomerules*, more or less distinct, or irregularly scattered; "apothecia non rite evoluta visa."

On maritime rocks, rare. 1866.

SYN :—Nyl. En. Gen. p. 144. (1853).
GEOG. DISTRIB .—France.
BOT. PROV :—7. 15. 31.
SCOTLAND.—Cairn Gowar (3690 ft.) *Rev. J. M. Crombie.*
WALES :—Barmouth !
CHANNEL ISLANDS :—Noirmont and La Moye, Boulay Bay, Jersey. *Mr. Larbalestier.* (1866).

5. *P. furfurea*, Nyl. fuscous-black or black, *when moist rubricoso-nigricant or rubricoso-rufescent*, *granulato-areolate*; *apothecia nearly urceolariform*; spores 8, colourless, ellipsoid, simple; gelatina hymenea vinous-red with iodine.

On alpine rocks, rare. 1864.

SYN :—Nyl. in Flora, 1865. p. 353. Carroll in Seem. Journ. Bot. 3. 286.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers !; near Loch Tay and in Glen Dochart. *Adm. Jones.* (1864).

6. *P. phylliscella* Nyl. *dark-brown*, effuse, *squamulose*, *squamules subverruculoso-unequal*, *subadnate*, *aggregated*, but not continuous, *rotundato-deformed*; *apothecia endocarpoid*, very minute,

5-15 in each thalline squamule; epithecium punctiform, concolorous, with thalline margin; spores 8, oblongo-ellipsoid; paraphyses few, slender; gelatina hymenea I.bluish, and thecæ dark-violet.

On quatzose boulders in sub-alpine streams, rare. 1870.

SYN :– Nyl. in Flora. 1875 p. 102.
BOT. PROV : –15.
SCOTLAND :—Ben-y-gloe, Blair Athole. *Rev. J. M. Crombie.* (1870).
"Nearly allied to Pt. Tasmanica, Nyl. Spores .005—7 mm. long, about .003 broad. Thalline squamules composed of minute coalescent granules. Spermatia slender, oblong or fusiform-oblong" (Nyl.)

7. *P. hæmalea*, (Smrft) *fuscescenti-rufous, crustæform, diffracto-rimose, granulato-rugose; apothecia* very much crowded, *innate*, plano-convex, shining, *nigrescent*, when moist olivaceo-fuscescent, thalline margin crenate, at length excluded.

On alpine rocks, rare. 1871.

SYN : - *Collema hæmaleum*, Smrft. Lapp. 117. (1826.) Stirton in Grevillea. 2. 71.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15. 26.
SCOTLAND :—Ben Lawers. *Dr. Stirton* (1871).
IRELAND :—Doughruagh mountain, Galway. *Mr. Larbalestier.*

8. *P. granatina*, (Smrft.) *fusco-rufescent, tartareous, effuse, rimoso-diffract, granulose, granules rugoso-nodulose*, somewhat plane, opake, often contiguous, rotundato-difformed; *apothecia minute, numerous in each thalline granule*, internally whitish, reddish, shining, *margin thin, entire, whitish;* spores 8, colourless, ellipsoid, simple, or spuriously 1-septate; gelatina hymenea and thecæ blue with iodine.

On mountain rocks, very rare. 1865.

SYN :—Smrft. Lapp. 90. (1826). Nyl. Lapp. or. 104. Crombie En. 2.
EXS :—Fellm. 4.
GEOG. DISTRIB :—Russia, Lapland.
BOT. PROV :—7, 15.
SCOTLAND :—Ben Cruachan in Breadalbane. *Rev. J. M. Crombie.* (1865). Ben Lawers. *Dr. Holl.*
WALES :—Cader Idris. *Dr. Holl.*
"Spores .009 –.012 mm. long, .0045—.0055 mm. broad." *(Nyl.)*

## III. COLLEMA. *Ach. Nyl.* *

Thallus very various, granula gonima moniliform, no distinct cortical layer. Apothecia rufescent, lecanorine. Spores 8, simple or variously divided, septate and murali-locular.

* *Spores unknown.*

1. *C. lichinodeum*, Nyl. fuscous-black, *lineari-laciniose, laciniæ ligulate*, 2-3-*divided*, apices obtuse, internally almost as in *Ephebe* but with small brown moniliform gonima; apothecia unknown.

On decaying mosses on alpine rocks, rare. 1865.

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* In this genus and Leptogium I have entirely followed the a rangement of Dr. Nylander and Mr. Crombie in Journ. Bot. (1874).

SYN :—Nyl. in Flora, 1869, p. 293. Carroll in Seem. Journ. Bot. 3. p. 287.
GEOG. DISTRIB :—Prussia.
BOT. PROV:—15.
SCOTLAND :—Summit of Ben Lawers! plentiful, but sterile. *Adm. Jones* (1865).
Crombie l.c. remarks that "probably this species belongs to a distinct genus, which may be named *Lichinopsis*, though as the fructification is at present entirely unknown, it is best retained as constituting a separate section of *Collema*."

** *Spores simple.*

2. *C. chalazanum*, Ach, *black*, difformi-lobate or laciniate, margins *crenulato-granulate; apothecia* rufous, *small, thalline margin tumid; spores* 8, colourless, *ellipsoid*, simple; paraphyses slender; gelatina hymenea vinous-red with iodine; spermatia slender, obtuse at each apex.

On sub-alpine calcareous rocks, rare. 1834.

SYN :—Ach. L.U. 633. (1810); Syn. 104. Nyl. Scand. 28. Carroll in Seem. Journ. Bot. 4. 22.
FIG :—Hepp Sporen, t. 75 f. 661.
EXS :—Zw. 164. Anzi Venet. 7. Hepp. 661.
GEOG. DISTRIB :—Germany, Italy, Switzerland.
BOT. PROV :—1 ..5...7...19, 20.
ENGLAND :—Cheddar. *Mr. Borrer*. St. Vincent's Rocks, Bristol. *Mr. Thwaites*.
SCOTLAND :—Appin. *Rev. J. M. Crombie*
IRELAND :—Near Dunkerron, Kerry, *Mr. J. Taylor*. (1834). Near Fermoy, *Mr. T. Chandler*.
WALES :—Eglswg rocks! near Llangollen.
"Spores .020—28 mm. long, .010—13 mm. broad." *(Nyl.)*

3. *C. chalazanodes*, Nyl., similar to *C. chalazanun*, Nyl., but with much smaller often subglobose spores .012—17 mm. long, .008—.015 mm. broad. Thecæ clavate.

On rocks.

SYN :—Nyl. in Flora. 1869, p. 293.
GEOG. DISTRIB :—Norway.
Crombie l.c. says "Intermediate, as it were, between the preceding and the following species, with larger subglobose spores."

4. *C. myriococcum*, (Ach.) *black*, difformi-lobate or laciniate, *crenulato-lobate;* apothecia rufous, small, thalline margin tumid; *spores* 8, colourless, *sub-globose*, simple, small.

On mossy walls, rare. 1869.

SYN :—Nyl. in Flora, 1860. p. 293. Crombie En. 4.
GEOG. DISTRIB :—Norway.
BOT. PROV :—1. 5.
ENGLAND :—Bradley wood, near Newton Bushell, Devon! *Dr. Holl.* (1869). Ablington, Barnsley Park, near Cirencester. Gloucestershire, *Mr Joshua*.
Crombie l.c. remarks, "this species is with difficulty to be distinguished from the two preceding ones, and probably all three are referable to one and the same variable species."
"Spores .009—012 mm. diam." *(Nyl)*

5. *C. confertum*, Ach. nigricant, small, *crowdedly and turgidly squamulose, squamules* generally *cyathoid or podetiiform*, nearly all fertile; *apothecia* (one in each thalline squamula or lobe, *urceolate* at the summit) subconcolorous, impressed, thalline margin tumid; spores 8, colourless, ellipsoid or fusiformi-ellipsoid, simple; paraphyses slender; gelatina hymenea and especially asci blue with iodine.

On the earth, rare. 1810.

SYN :—Ach. L.U. 634 (1810); Nyl. in Flora, 1867. p. 330.
BOT. PROV :—4.
ENGLAND - —Yarmouth. *Mr. D. Turner.* (1810). Rottingdean, near Brighton. *Mr. W. Joshua.*
"Spores .017—23, mm. long, .008—.010 mm. broad." *(Nyl.)*

*** *Spores 3-septate.*

6. *C. ceraniscum*, Nyl. *brownish-olive*, or *greenish-black*, *cæspitose*, *laciniato-lobate*, *lobes dilated upwards*, *erect*, crowded, *fastigiate*, *elongato-cylindrical*, obtuse; apothecia pale brown, minute, plane, *thalline margin* smooth, thin, *granulate;* spores 4, colourless, broadly oblong, 3-septate or irregularly murali-locular.

On earth in alpine localities, very rare.

SYN :—Nyl. in Flora 1865. p. 353. *C. ceranoides*, Mudd Man. 41, (non Borr.). Carroll in Seem. Journ. Bot. 3. 287.
BOT. PROV. 15.
SCOTLAND :—Summit of Ben Lawers. *Adm Jones.*

7. *C. auriculatum*, Hffm. *dark-green* or darkly viridi-glaucescent, *rigid*, opake, dilated, *lobate*, lobes somewhat imbricate, *more or less granulose*, irregularly repando-crenate; *apothecia rufous*, *innate or emergent*, *margin thick*, *more or less granulose;* spores 8, colourless, ovoid, 3-septate.

On mossy walls in sub-alpine localities, rare. 1869.

SYN :—Hffm. Fl. Germ. 2. p. 98 (1795). Nyl. Syn. 106. Crombie in Seem. Journ. Bot. 8. 96.
FIG : —Schær. Enum. t. 10, f. 3.
EXS :—Zw. 162. A.B. Schær. 432
GEOG. DISTRIB :—Switzerland, France, Germany.
BOT. PROV :—16.
SCOTLAND :—Appin, Argyleshire. *Rev. J. M. Crombie.* (1869).

Forma *membranacea*, Kplhb. thallus membranaceous.

SCOTLAND :—Rare in S. W. Highlands near Inverary. *Rev. J. M. Crombie.*

Var. *pinguescens.* Nyl. thallus thicker, lobes more divided.

On shady walls and calcareous rocks, amongst decayed mosses, scarce.

SYN :—Nyl. in Flora 1872. p. 353. Crombie in Journ. Bot. n.s. 2. 133.
SCOTLAND :—Finlarig, Killin, Craig Tulloch, Blair Athole. *Rev. J. M. Crombie.*
Crombie l.c. states, "this, according to the authentic specimen ex herb. Sowerby in Herb. Mus. Brit. *manu* Borrer, is entirely identical with *C. dermatinum*, Borr."

8. *C. furvum*, Ach. *dark fuscous-green* or *nigro-olivaceous*, *membranaceous*, *granulate*, *lobate*, *lobes complicate*, often undulate, bloody-red with iodine; apothecia fuscous, plane, thalline margin entire; spores 8, colourless, ovoid or ellipsoid, 3-septate, irregularly murali-locular.

On sub-alpine rocks, not unfrequent. 1741.

SYN :—Ach. Prodr. 132. (1798). Nyl. Scand. 29. *C. tunæforme*, Ach. Syn. 332. *Lichen granulatus*, Sm.
FIG :—E. Bot. t. 1757.
EXS :—Hepp. 414.
GEOG. DISTRIB :—Europe, Sweden, Finland, Switzerland.
BOT. PROV :—1, 2, 3 ..5...7...10, 11,12...19...30.
ENGLAND :—Oxford. *Dillenius.* (1741). near Kirkby Lonsdale. *Sir J. E. Smith.* Shanklin. *Rev. T. Salwey.* Bolton Woods and Ingleborough, Yorkshire. *Dr.*

*Carrington*. Frosterley; and Stanhope, Wear Valley, Durham. *Mr Mudd*. S. Devon; Isle of Wight; Torquay. *Dr. Holl*. Pentregaer near Oswestry. *Rev. T. Salwey*. Amberly near Stroud. *Mr. W. Joshua*. Between Staplehurst and Boughton Monchelsea, and near Lympne, Kent. *Mr. Holmes*.

IRELAND:—Near Belfast. *Mr. Templeton*. Dunkerron. *Dr. Taylor*. Killarney. *Dr. Carrington*.

WALES:—Garregwen rocks. *Mr. Griffith*.

Crombie l.c. says, "The true plant, which is best distinguished by the reaction with I from other species, with which it might be confounded, does not appear to be at all common in this country. The form *tunæforme*, Ach. is characterised merely by having the lobes of the thallus longer and more deeply incised."

9. *C. pulposum*, (Bernh.) dark green or *fusco-olivaceous, orbicular*, lobate, *lobes subimbricate*, often plicate; *apothecia rufescent*, moderate, plane, thalline margin entire; spores 8, ovoid, 3-septate, often with longitudinal septa.

On calcareous earth in sub-alpine places, not unfrequent. 1785.

SYN:—Bernh. in Schrad. Journ. Bot. 1799, vol. 1. p. 7. Ach. Syn. 311. Nyl. Scand. 30.

FIG:—Bernh. l. c. t. 1. f. 1. Schær. En. t. 10, f. 5. E. Bot. t. 834.

EXS:—M. & N. 1057. Schær. 428-430. Zw. 160, 161, 163, 165.

GEOG. DISTRIB:—Central Europe, North Africa, Asia, North America, Scandinavia.

BOT. PROV:—1, 2, 3, 4, 5, 7...12...15...19...26...31.

ENGLAND:—Oxford, *Dr. Sibthorp*. Cambridge, *Rev. R. Relhan*. (1785,) Cumberland! *Mrs. Stanger*. Clifftops, between Newhaven and Rottingdean; Crocker Hill, Slindon; Horsham Church; Southover, Lewes; Hurstpierpoint; Tunbridge Wells. *Mr. Borrer*. Budleigh Salterton. *Prof. Dickie*. near Keston Common; Wrotham; Wye; Folkestone; Shoreham; Sandwich; Kent. *Mr. Holmes*. Lydiard Tregoze, Wilts; Gloucestershire. *Mr Joshua*. Llanyblodwel Rocks! Llanymynech Hill! High Rock, near Bridgnorth, Shropshire!

SCOTLAND:—Northern parts. *Rev. J. M. Crombie*.

IRELAND:—On walls, frequent. *Mr. Carroll*. Killarney. *Dr. Carrington*. Ballinahinch! Galway. *Mr. Larbalestier*.

CHANNEL ISLANDS:—Doyle Pillar, Guernsey, and common on all the Islands. *Mr. Larbalestier*.

"Spores .016—24 mm. long, .007—.010 mm. broad." (*Nyl.*)

Forma *granulatum*, Sw. lobes of thallus and margins of apothecia more or less granulated.

In limestone districts, frequent, rarely fertile. *(Crombie l.c.)*

Forma *compactum*, (Ach.) thallus closely imbricated; apothecia immersed.

ENGLAND:—Rare in S. & W., hardly fertile, though spermogoniferous. *Rev. J. M. Crombie*. (l. c.) near Cirencester, *Mr. Joshua*.

Forma *hydrocharum*, (Ach.) glaucous, thalline lobes thick, discrete, expanded and radiant, oval, repand and incised.

On damp calcareous rocks, very sparingly and infertile.

SCOTLAND:—Craig Tulloch. *Rev. J. M. Crombie* (l.c.)

Var. *ceranoides*, Borr. *olive-brown*, sub-virescent, or nigricant, *rotundato-pulvinular*, lobate, *lobes imbricated, ascending, dilated upwards, proliferous, narrowly and elongato-laciniate, laciniæ subcylindrical, graniform, fastigiate*, crowded, turgid; apothecia brown, sessile, convex, *margin* entire or crenulate or *elongato-granulate;* spores 8, colourless, 3-septate.

On chalk, rare. 1831.

SYN:—Borrer in E. Bot. Suppl. 2704. (1831); Crombie En. 6.

FIG:—E. Bot. Suppl. t. 2704. f. 2.

BOT. PROV :—2, 3...5.
ENGLAND :— Boxgrove, near Chichester. *Mr. R. J. F. Thomas.* (1831). Sussex Downs. *Mr. Borrer.* Henham, Essex. *Mr. Forster.* Llanforda garden wall, near Oswestry. *Rev. T. Salwey.* near Cirencester. Minchinhampton Common. *Mr. Joshua.* near High Elms, Chelsfield, Kent. *Mr. Holmes.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*
Crombie l.c. says, " This, according to the fragment of the original specimen in Herb. Sowerby, attached to the fig. drawn for E. Bot. Suppl. seems to be referable to the present species, but the characters of the plant in Herb. Borrer at Kew are not very definite."

Var. *pulposulum,* Nyl. much smaller than the type, minutely granuloso-lobulate, subeffuse ; apothecia with an entire thalline margin.

On the earth, very rare.

SYN:—Nyl. Egypt. p. 1.
ENGLAND :—Near Cirencester. *Mr. Joshua.*

Var. *tenax,* Ach. darkly glaucescent or virescent; *apothecia* rufous, *innate,* thalline margin less prominent.

On earth, in upland mountainous districts, rare. 1811.

SYN:—Ach. Syn. 814. (1817). Nyl. Scand. 30.
FIG :—E. Bot. 2349. Hepp Sporen t. 11, f. 87.
EXS :—Leight. 105, 290. Mudd 1. Hepp 87.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—2...5...7...10...16 ..19.
ENGLAND :—Oswestry, Shropshire. *Rev. T. Salwey.* Ayton ! Cleveland. *Mr. Mudd.* Sussex ! *Mr. Borrer.*
SCOTLAND :—Appin. *Rev. J M. Crombie.*
IRELAND:—Blackstone Bridge. co. Cork. *Mr. Carroll.*
WALES :—North Wales. *Rev. Hugh Davies.* (1811). Barmouth ! Between Llangollen and Corwen !

10. *C. subplicatile,* Nyl. in Flora 1873, p 364. *C. plicatile,* Arn. in Flora 1867 *pro. p.*

SCOTLAND :—Appin. *Rev. J. M. Crombie.*
Of this I have seen no specimen, nor has any diagnosis been published.
Crombie l. c. says, "sufficiently similar to *C. pulposum,* but with much larger spores."

11. C. *limosum,* Ach. *dark green, thin, appressed, lobes small,* scattered, thick and pulpy when moist, slightly crenulate ; *apothecia rufous,* plane, moderate, *margin prominent, entire or slightly crenulate ;* spores 8, colourless, ovoid, 3-septate, with occasional longitudinal septa.

On wet clayey soil, not unfrequent. 1831.

SYN :—Ach. L. U. 639. Syn. 309. Nyl. Scand. 30.
FIG :—E. Bot. Suppl. t. 2704. f. 1.
GEOG. DISTRIB :—France, Sweden.
BOT. PROV :—2, 3...5...7.
ENGLAND :—Hurstpierpoint, Sussex. *Mr. Borrer.* (1831). near Wooton-under-Edge. *Mr. W. Joshua.* near Chelsfield, Kent. *Mr. Holmes.*
WALES :—Nevin !
Crombie l.c. says, "easily recognised from the allied species by the adglutinated evanescent thallus and the appressed thinly-margined apothecia."

12. *C. crispum,* (Huds.) *olivaceo-virescent or fusco-virescent, orbicular, lobato-divided* or subradiate, *margin granulate and crenate ; apothecia darkly rufescent, thalline margin granulate ;* spores 8, colourless, ovoid, 3-septate, irregularly muriformi-locular.

On gravelly earth, frequent. 1831.

SYN :—Huds. Fl. Angl. 447. (1762.) Ach. Syn. 312 ; Nyl. Scand. 30.
FIG :—E. Bot. Suppl. t. 2716. f. 1. Dill. t. 19. f. 23.
EXS :—Leight. 106. Mudd 2. Zw. 159. Fellm. 7.
GEOG. DISTRIB :—N. and Central Europe.
BOT. PROV .—1, 2, 3...5...10, 11 14, 15, 16...19, 20...31.
ENGLAND :—Sussex. *Mr. Borrer.* (1831) ; Coatham Marshes, near Redcar, Cleveland. *Mr. Mudd.* Dawlish. *Mr. Parfitt.* Hudshead, Berwick-on-Tweed. *Dr. G. Johnston.* Gloucestershire. *Mr. Joshua.* Westerham ; Chelsfield, Kent. *Mr. Holmes.*
SCOTLAND:—Appin and Killin. *Rev. J. M. Crombie.* near Edinburgh. *Dr. Greville.* Forfarshire. *Mr. G. Don.*
IRELAND :—On limestone rocks and walls, common. *Mr. Carroll.*
CHANNEL ISLANDS :—Shore of Herm. L'Etacq, Jersey. *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

Var. *cristatulum*, Nyl. thallus microphylloid.
Herm. *Mr. Larbalestier.* Gloucestershire. *Mr. Joshua.*

13. *C. cheileum*, Ach. *dark-olive or fusco-nigricant*, lobate or *crenato-granulose ;* apothecia rufous, plane, moderate, *thalline margin granulate ;* spores 8, colourless, oblongo-ellipsoid, 3-septate, or submurali-divided.

On walls and calcareous rocks, frequent.

SYN :—Ach. Syn. 310. Nyl. Scand. 31.
FIG :—Hepp Sporen t, 105, f. 923.
EXS :—M. & N. 1056. 456. Nyl. 4. Schær. 425. Zw. 157, 158. Mudd 3. Hepp 923. Larbal. 52.
GEOG. DISTRIB :—Central Europe, Sweden, Algeria.
BOT. PROV :—1, 2, 3...5, 6...10.. 15...19...31.
ENGLAND :—Pinchingthorpe, Yorkshire. *Mr. Mudd.* Torquay. *Mr. Parfit.* near Hastings ; and near Shanklin, Isle of Wight, *Dr. Holl.* near Cirencester. *Mr. W. Joshua.* Postling ; Maidstone ; Wrotham ; Boughton Monchelsea ; Sevenoaks ; Brastead, Kent. *Mr. Holmes.*
SCOTLAND :—Northern parts, *Rev. J. M. Crombie.*
IRELAND :—Killarney. *Mr. Hardy.*
WALES :—Pyle, Glamorgan. *Dr Holl.*
CHANNEL ISLANDS :—Quenvais, Jersey, and common on all the islands. *Mr. Larbalestier.*

Forma *nudum*, (Schær.) thalline lobes broader, egranulose.

SCOTLAND :—Killin. *Rev. J. M. Crombie.*
IRELAND :—South parts.

Forma *monocarpon*, (Duf.) thallus microphylline or nearly obliterated ; apothecia with a crenulate thalline margin.

SYN:—Nyl. Syn. p. 111. (1858.)
GEOG. DISTRIB .—France.
BOT. PROV:—5.
ENGLAND :—Near Cirencester, *Mr. Joshua.*

14. *C. melænum*, Ach. *nigricant or nigro-olivaceous, orbiculate, laciniate, laciniæ elongate*, convex beneath, *margins elevated, undulato-crispate*, crenate, sometimes complicate ; *apothecia reddish-brown*, plane or somewhat concave, thalline margin crenulate ; spores 8, colourless, ovoid, 2-3-septate and longitudinally divided, irregularly murali-locular ; gelatina hymenea intense blue with iodine.

On calcareous rocks, frequent. 1741.

SYN :—Ach. Syn. 315. (1817). Nyl. Scand. 29. *C. multifidum.* Schær. En. 254. *Lichen marginalis.* Huds. Fl. Angl. 534.
FIG :—E. Bot. t. 1924.
EXS :—M. & N. 455. Zw. 154, 155.
GEOG. DISTRIB :—Central Europe, Germany, Pyrenees, Scandinavia.
BOT. PROV :—1...5...7, 8...10, 11 . 14...17...19...26, 27...30, 31.

ENGLAND :—Derbyshire ; near Settle and Kirby Lonsdale, Yorkshire. *Sir J. E. Smith.* Lucton, co. Hereford. *Mr. Littleton Brown.* (1741). Northern Counties. *Mr. Hudson.* Pentregaer near Oswestry. *Rev. T. Salwey.* Teesdale. *Mr. Robertson.* St. Michael's, Torquay. *Mr. Borrer.* Berwick-on-Tweed. *Dr. Johnston.* Totness Castle ; North Bovey and Ilsington, Devon. *Messrs. Jones & Kingston.* Gloucestershire. *Mr. Joshua.* Abdon ! Shropshire.

SCOTLAND :—Highlands. *Sir J. E. Smith.* Coygach, Sutherlandshire. *Mr. Borrer.* near Edinburgh. *Mr. Stewart.*

IRELAND :—Near Belfast. *Mr. Templeton.* Bantry. *Miss Hutchins.* near Galway. *Dr. Moore.* Middleton, near Cork. *Mr. Carroll.* Bulben, Sligo. *Dr. Dickie.*

WALES :—Caernarvon. *Mr. Hudson.* near Cefn House, Denbighshire. *Mr. Griffith.*

CHANNEL ISLANDS :—Quenvais and La Moie, Jersey ! *Mr. Larbalestier.*

"Spores .021—27 mm. long, .009—.011 mm. broad." *(Nyl.)*

Forma *marginale*, (Huds.) imbricate, multifid, dentato-crenate ; apothecia marginal, plane, nigro-fuscous.

On rocks.

SYN :—Huds. Fl. Angl. 534. (1778.)
ENGLAND :—Shipton, Gloucestershire. *Mr. Joshua.*

Forma *jacobæifolium*, (Schrank.) lobes deeply laciniate, laciniæ radiant, straight, narrow, elongate, broader outwards, lacero-pinnatifid ; apothecia marginal.

SYN :—Schrank. Fl. Bau. 530.
IRELAND :—South-western portions, *Crombie.* l.c.
CHANNEL ISLANDS :—*Crombie.* l.c.

Forma *gyrosum*, Ach. lobes gyroso-complicate ; apothecia marginal.

SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*

Var. *complicatum*, Schl. Schær. laciniæ elongate, somewhat concave, imbricato-lobulate, *lobes complicate*, margins entire ; apothecia large.

On calcareous rocks, frequent.

SYN :—Schær. Enum. 255. (1850) ; Crombie En. 5.
FIG :—Schær. En. t. 10, f. 4.
EXS :—Schær. 418, 419.
GEOG. DISTRIB :—Switzerland.
BOT. PROV. :—16.
ENGLAND :—Teesdale. *Mr. Baker.*
SCOTLAND :—Killin. *Rev. J. M. Crombie.*

15. *C. hypergenum*, Nyl. nearly similar to *C. melanum*, but with larger spores .026—36 mm. long, .010—16 mm. broad.

On calcareous rocks. 1876.

SYN :—Nyl. in Flora 1876. p. 232.
IRELAND :—Tullywhee Bridge, Kylemore, Connemara. *Mr. Larbalestier.* (1876.)

16. *C. granuliferum*, Nyl. *nigricant or nigro-olivaceous*, orbiculate, firm, *sprinkled* more or less *with isidiose globules*, laciniate, laciniæ in a dry state on the under surface often longitudinally and crowdedly *thinly rugulose-plicate ;* apothecia moderate, reddish, thalline margin at length subcrenate ; spores 8, colourless, oblong, 3-*septate, sometimes with* 1—2 *connecting septules.*

On old walls and calcareous rocks, rarely among mosses on the ground

SYN :—Nyl. in Flora. 1875. p. 103.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...5...15.
ENGLAND :—Cheddar Cliffs. *Mr. Joshua.* Leigh Woods and Kingsbridge. *Mr. Holmes.*
SCOTLAND :—Appin. *Rev. J. M. Crombie.*
IRELAND :—Killarney. *Mr. Hardy.*
"In general aspect somewhat similar to *C. melænum*, Ach. Spores 0.025—32 mm. long. 0.008—12 mm. broad." *(Nyl.)*

Forma *meizolobum*, Nyl. lobes of thallus larger.

SYN :—*C. flaccidum, var. microlobum*, Nyl. Crombie Enum. 5. Leight. Lich. Fl. 2d ed. 26.
IRELAND :—Muckruss, Killarney, *Mr. Hardy.*

Forma *minor*, Cromb. thallus poorly developed, resembling *C. pulposum, f. granulatum*, Sw.

17. *C. granuliforme*, Nyl. *fuscous-black, granulato-areolate*, forming dilated patches, *areolæ small, granuliform* or subverrucose; apothecia unknown.

On granitic rocks, very rare, 1876.

SYN :—Nyl. Lich. Scand. p. 28. (1861.)
BOT. PROV :—26.
IRELAND :—South side of Kylemore Lake, co. Galway. *Mr. Larbalestier.* (1876.)

18. *C. cristatum*, (Hoffm.) Schær. *blackish-green*, coriaceous, laciniate, *closely adnate*, when moist turgescent and olive-green, *laciniæ abbreviate, somewhat broad, imbricato-aggregate, margins undulate, crispato-crenulate*, extremities inciso-crenate; apothecia fuscous, large, superficial.

On calcareous rocks.

SYN :—Hoffm. D. Fl. 2. p. 101. (1791.) Schær. En. 255.
FIG :—Dill. t. 19 f. 26.
Crombie l.c. says, "Differs from the preceding *(C. melænum.)*, though perhaps only as a sub-species, in the imbricato-aggregated laciniæ, and the slightly different character of the spores, probably not very rare in upland tracts, though, till recently, overlooked as a British plant."

19. *C. polycarpon*, (Schær.) nigricant or nigro-olivaceous, orbicular, *laciniæ radiant, nearly undivided*, narrow, *margins thickened and elevated; apothecia very numerous*, covering nearly the entire thallus, reddish-brown, plano-convex, thalline margin *entire*, paler, thickish, elevated, or somewhat incurved; spores 8, colourless, elongato-ovoid, 2-3-septate, cells nucleolate.

On calcareous rocks, rare.

SYN :—Krplhb. Ges. 2. 577. (1869) Korb. Par. 417. Crombie in Journ. Bot. n.s. 2.133. *Parm. multifida var. polycarpa*, Schær. Spic. 532.
FIG :—Hepp Sporen t. 105. f. 919. Arnold in Flora 1867. t. 3. f. 67, 68.
EXS :—Schær. 421. Hepp 919. Anzi Langob. 4. Th. M. Fries Scand. 49.
GEOG. DISTRIB :—Scandinavia, Switzerland, Italy, Pyrenees, Bavaria.
BOT. PROV :—5...16.
ENGLAND :—Cheddar Cliffs; near Kendal, near Oaksay, Gloucestershire. *Mr. Joshua.*
SCOTLAND :—Appin, Argyleshire. *Rev. J. M. Crombie.*
Crombie l.c. says, "Distinguished by the pulvinate thallus, and the spores at length 3-septate."

20. *C. Laureri*, (Fw. Krb.) dark-olivaceous, membranaceo-cartilaginous, subflaccid when moist, centrifugal, inciso-lobate, *laciniæ*

*undulate, lobulate, margins erect, under surface albo-fibrillose; apothecia* moderate, scattered, *numerous, very shortly stipitate, reddish-brown*, plane, proper margin very thin and obscure, thalline margin thickish, granuloso-rugulose; *spores* 8, colourless, *linear-oblong, 3-septate.*

On stone-walls, rare.

SYN :—Korb. S. L. G. 414. (1855); Arnold in Flora 1867 p. 135. Crombie in Journ. Bot. n.s. 2. 133. *Synechoblastus complicatus*, Mudd Man. 44. (in part).
FIG :—Mudd l. c. t. 1. f. 6. Hepp Sporen, t. 106. f. 931. Arnold in Flora 1867. t. 4. f. 81—84.
EXS :—Hepp 931. Anzi Langob. 5.
GEOG. DISTRIB :—Pyrenees, Italy, Switzerland.
BOT. PROV:—11.
ENGLAND :—Near High Force Inn, Teesdale, Durham. *Mr. Mudd.*
Crombie l. c. says, "Distinguished by having the thallus broader, and the spores 3-septate and obtuse at either apex, but apparently a somewhat doubtful British lichen."

**** *Spores pluriseptate.*

21. *C. stygium*, (Del.) black, laciniate, laciniæ deeply incised, rotundato-lobate at the extremities; apothecia atro-rufous.

On stone walls, and calcareous rocks, rare.

SYN :—Schær. Spic. 544. (1840). Arnold in Flora 1867, p. 135 and 141. Crombie in Journ. Bot. n. s. 2. p. 132.
FIG :—Whlnb. N. Act. Stockh. 27. p. 145, t. 4. f. 5. Flora 1867. t. 3. f. 69—72.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—5...11,...12...26.
ENGLAND :—Near High Force Inn, Teesdale, Durham. *Mr. Mudd.* near Kendal, Westmoreland. *Mr. Martindale.* Shipton! Ablington! Gloucestershire. *Mr. Joshua.*
IRELAND :—Kylemore Lake. *Mr. Larbalestier.*
Crombie l. c. says, "Similar to the preceding species, but with 3-5-septate spores."

22. *C. flaccidum*, Ach. *dark-green* or fuscous-green, membranaceous, *undulato-plicate*, lobate, *lobes large, expanded, flexuose;* apothecia rufescent, plane, margin entire; spores 8, colourless, ovoid or broadly fusiformi-oblong, 4-6-septate.

On rocks and walls and trees in mountainous districts, not unfrequent, but rare in fruit. 1783.

SYN :—Ach. Syn. 322. (1817). Nyl. Scand. 29.
FIG :—E. Bot. t. 1653.
EXS :—M. & N. 1059. Zw. 166. Schær. 412. Leight. 345.
GEOG. DISTRIB:—Europe.
BOT. PROV :—1, 2...5...7...10...12...15...19, 20...26, 27...30.
ENGLAND :—Westmoreland. *Sir J. E. Smith.* (1783). Devonshire. *Mr. Dickson.* Pyecombe, Sussex. *Mr. Borrer.* Sidmouth. *Rev. T. Salwey.* Bolton Woods. *Dr. Carrington.* near Exeter. *Adm. Jones.* Rievaulx, Yorkshire. *Mr. Baker.* Holwick, Yorkshire. *Mr. Robertson*, Plymouth and Budleigh Salterton. *Mr. Parfitt*, Llanymynech Hill! Llanyblodwel Rocks! Shropshire.
SCOTLAND :—Northern parts. *Mr. Dickson.* Kinnoull Hill, Perth. *Dr. Lindsay.* Killin. *Rev. J. M. Crombie.* Kenmore, Perthshire. *Dr. Holl.* Reeky Linn; Clova. *Mr. G. Don.*
IRELAND :—Bantry, *Miss Hutchins.* Mallow and Castlemartyr, co. Cork. *Mr. Carroll.* Moyne Abbey, co. Mayo and Ben Bulben, Sligo. *Dr. Dickie.* Killarney. *Dr. Carrington.* Aghalee Bridge, Lagan Canal. *Dr. Moore*, Kylemore Lake, *Mr. Larbalestier.*
WALES :—Trecastle; Cader Idris. *Mr. Ralfs.* Harlech. *Mr. Borrer.* Corsygedol; Rhaiadr Du, near Barmouth. *Rev. T. Salwey.* Barmouth! Bettws-y-coed! Tremadoc!
CHANNEL ISLANDS :—St. Martin's, Jersey. *Mr Larbalestier.*
"Spores .023—28 mm. long, .007—010 mm. broad." *(Nyl.)*

23. *C. fasciculare*, (Linn.) *dark-green* or *fuscovirescent*, *suborbicular*, *crenato-lobulate*, generally *in erect*, *sub-podicellate conglomerations*, dilated upwards, (with iodine blood-red); *apothecia* rufescent, *crowded*, biatorine, somewhat convex, margin thin, undulate; spores 8, colourless, fusiform, 3-septate.

On old trees, rare. 1741.

SYN :—*Lichen fascicularis*, Linn. Mant. 2. 133. (1771). *Collema conglomeratum*. Hffm. Fl. Germ. p. 102. (1795); Ach. Syn. 317. Nyl. Syn. 115.
FIG :—E. Bot. t. 1162. Nyl. Syn. t. 3, f. 1.
EXS :—Zw. 167. Nyl. 102.
GEOG. DISTRIB :—Central Europe, France, Germany.
BOT. PROV :—2, 3, 4...7...11, 12, 13...15, 16.
ENGLAND :—St. Leonard's Forest, Sussex; Oxford. *Dillenius*. (1741). Ambleside, Westmoreland. *Sir. J. E. Smith*. Gogmagog Hills; Newmarket Heath; Cambridge. *Rev R. Relhan*. N.E. side of Stiperstones, Shropshire. *Rev. E. Williams*.
SCOTLAND :—Near Lake Katrine; Appin; Fort William. *Rev. J. M. Crombie*. Aberfeldy, and near Kenmore. *Dr. Holl*. Forfarshire. *Mr. G. Don*. Dumfriesshire. *Dr. Burgess*. Barcaldine in Lorn. *Rev. J. M. Crombie*.
WALES :—Nant Glyn, Denbighshire. *Mr Griffith*.
"Spores .016—29 mm. long, .004—6 mm. broad." *(Nyl.)*
Crombie l. c. remarks, "Easily recognized by the fasciculate lobules of the thallus and the biatorine apothecia."

24. *C. multipartitum*, Sm. *fusco-olivaceous* or nigrescent, *laciniate*, *radiate*, *laciniæ narrow*, *multifid*, somewhat convex, *lobato-partite at the apex*, lobes divergent; apothecia atro-rufous, moderate, plane, thalline margin thickish, even; spores 8, colourless, cylindrical, curved, oleoso-locular; paraphyses thick, pauci-articulate.

On sub-alpine calcareous rocks, not unfrequent. 1782.

SYN :—Sm E. Bot. 2582. (1814); Nyl. Syn. 116.
FIG :—E. Bot. t. 2582. Nyl. Syn. t. 2. f. 8.
BOT. PROV :—1...5...7, 8...10, 11, 12. .16...19...26.. 28.
ENGLAND :—Kendal, Westmoreland. *Sir J. E. Smith*. (1782.) Devonshire. *Adm. Jones*. Moelydd and Pentregaer, near Oswestry. *Rev. T. Salwey*. Cheddar; Weathercote, Yorkshire. *Mr. Borrer*. Middleton Beck, Durham. *Mr. Robertson*. Buxton. *Dr. Holl*. near Yatton, Somerset; Barnsley Park, Gloucestershire. *Mr. Joshua*. Abdon Burf! Llanymynech Hill! Shropshire.
SCOTLAND :—Appin. *Rev. J. M. Crombie*. Ben Lawers. *Dr. Holl*.
IRELAND :—Killarney. *Sir T. Gage*. Dunkerron. *Dr. Taylor*. Middleton, near Cork. *Mr. Carroll*. Sheepwalk, Armagh. *Adm. Jones*. Castle Taylor, Galway. *Dr. Moore*. Lough Inagh and Ballynakill Bay, Galway. *Mr. Larbalestier*.
WALES :—Little Orme's Head! Eglwyseg rocks!
"Spores .028—48 mm. long. .007 mm. broad." *(Nyl.)*

25. *C. nigrescens*, (Huds.) *nigro-virescent*, thin, membranaceous, *submonophyllous*, *orbicular*, *depressed*, rotundato-lobate, *radiato-rugoso-plicatulate*, naked or granulate, *ascending in the centre*, *depresso-adnate at the circumference*; apothecia dark-rufous, plane, small, crowded, thalline margin entire; spores 8, colourless, fusiformi-cylindrical, pluri-septate.

On old trees, not unfrequent. 1741.

SYN :—Huds. Fl. Angl. 450. (1762). Linn. Suppl. Pl. p. 451. (1781); Ach. Syn. 321. Nyl. Syn. 114, *Lichen vespertilio*, Lightf. Scot. p. 840.
FIG :—Hffm. Pl. Lich. t. 37, f. 2. 3.
EXS :—M. & N. 164. Leight. 104. Schær. 410.
GEOG. DISTRIB :—Europe, Algeria, America, Asia, Polynesia, N. Zealand.
BOT. PROV :—1, 2, 3, 4, 5...7...14, 15...31.
ENGLAND :—Bagley Wood, near Oxford. *Dillenius*. (1741). Stotover Plantations, near Oxford. *Dr. Sibthorp*. Cambridgeshire. *Rev. R. Relhan*, near Bungay.

*Mr. Woodward*, near Holsworthy, Devon. *Mr. Newberry*. Sussex. *Mr Borrer*. Exeter. *Mr. Parfitt*. Malvern; Sussex; Isle of Wight; S. Devon; and Cornwall generally. *Dr. Holl*. Clapham; Kempston, Beds. *Rev. C. Abbot*. Pontesford Hill and Pulverbatch, Shropshire. *Rev. E. Williams*. North Bovey, Devon. *Rev. J. P. Jones*, Kemble, Gloucestershire. *Mr. Joshua*, near Penshurst; Beechborough; near Halstead, Kent. *Mr. Holmes*.

SCOTLAND :—Grampians. *Rev. J. M. Crombie*. near Kenmore and Killin, Perthshire. *Dr. Holl*. near Edinburgh. *Dr. Greville*. Reeky Linn; Den of Glammis; Glen Dole, Forfarshire. *Mr. W. Gardiner*.

IRELAND :—On old trunks frequent. *Mr Carroll*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Jersey and Guernsey, frequent; Seigneurie, Sark. *Mr. Larbalestier*.

"Spores .034—42 mm. long, .005 mm. broad." *(Nyl.)*

26. *C. aggregatum*, Ach. *nigro-virescent*, membranaceo-lobate, *rigid*, plicate, *not radiato-rugose, nor appressed*, difformed, lobes crenate, *margin granuloso-crispate;* apothecia rufous, crowded, moderate, plane, thalline margin thin, entire; spores 8, colourless, fusiformi-cylindrical, straight or curved, pluri-septate.

On old trees and rocks, rare.

SYN :—Ach. Syn. 317. (1817); Nyl. Syn. 115.
FIG :—Nyl. Syn. t. 2. f. 9.
EXS :—M. & N. 453.
GEOG. DISTRIB :—Europe, Asia, America, Polynesia.
BOT. PROV :—1, 2, 3 ..19.
ENGLAND :—Henfield, Sussex. *Adm. Jones*. near Exeter and near Tunbridge Wells. *Rev. J. M. Crombie*..
IRELAND :—Killarney. *Dr. Moore*.
"Spores .033—65 mm. long, .001—.005 mm. broad." *(Nyl.)*

27. *C. terrulentum*, Nyl. *olive-brown*, thin, *granulose; apothecia spadiceo-reddish, small, margined by the thallus;* spores 8, colourless, ellipsoid or oblongo-ellipsoid, 5-septate, submurali-divided; gelatina hymenea and especially thecæ I. bluish.

On old ash-trees. 1874.

SYN :—Nyl. in Flora. 1874. p. 305.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Loch Katrine. *Rev. J. M. Crombie*. (1874).
"Spores 0.018—24 mm. long, 0 010—12 mm. broad."

## IV. LEPTOGIUM. Ach.

Thallus very various, thin, granula gonima moniliform, cortical layer cellulose, distinct. Apothecia lecanorine or sub-biatorine. Spores 8, variously septate or divided.

1. *L. biatorinum*, Nyl. *fuscous or fusco-virescent, granuloso-lobulate, imbricate; apothecia rufescent, biatorine*, moderate, *urceolate, gyalectiform;* spores 8, hyaline, ovoid, 3-4-septate, sparingly longitudinally divided; gelatina hymenea and asci blue with iodine.

On mossy walls, chiefly in chalk districts, rare, 1866.

SYN :—Nyl. Prodr. 22. (1857); Syn. 110. Carroll in Seem. Journ. Bot. 4. 22.
GEOG DISTRIB :—France.
BOT. PROV :—3...31.
ENGLAND :—Maidstone, Kent. *Adm. Jones*. (1866.) "Pretty generally distributed in S. and W. England." *Rev. J. M. Crombie*. near Selling, Kent. *Mr. Holmes*.
CHANNEL ISLANDS :—Under Fort Essex, Alderney. *Mr. Larbalestier*.
"Spores .025—28 mm. long. .011—12 mm. broad." *(Nyl.)*

2. *L. microphyllum*, Ach. *dark olive* or *fuscous-green*, *microphylline*, *imbricated*, *lobes granulato-crenate*, *minute*, often verrucoso-diffract, effuse; *apothecia* pallido-rufescent, small, crowded, *urceolato-concave*, *thalline margin* nearly concolorous, *entire;* spores 8, colourless, ovoideo-ellipsoid, 3-septate; gelatina hymenea blue with iodine.

On old elms, rare, 1810.

SYN :—Ach. L. U. 630. (1810); Syn. 310. Nyl. Syn. 113.
FIG :—E. Bot. Suppl. t. 2721.
EXS :—M. & N. 948. Zw. 168. Nyl. 5. Schær. 411. Leight. 258.
GEOG. DISTRIB :—Central Europe, France, Sweden, Germany, Switzerland, Algeria.
BOT. PROV :—1, 3, 4, 5...10.
ENGLAND :—Near Bury St. Edmund's, Suffolk. *Rev. G. R. Leathes.* (1810). Dunsford near Exeter, Devon. *Mr Parfitt.* Ingleby Park, Cleveland. *Mr Mudd.* Lyndhurst, New Forest. *Rev. J. M. Crombie.* Danny; Ockley Green, Surrey. *Mr. Borrer.* near Worcester. *Dr. Holl.*
CHANNEL ISLANDS :—St. Martin's Quenvais, Jersey. *Mr. Larbalestier.*
Crombie l.c. states that "the two preceding species form a natural transition between *Collema* and *Leptogium*, the thallus having the structure of *Leptogium*, while the apothecia are those of *Collema*."
"Spores .016—24 mm. long. .008—.010 mm. broad." *(Nyl.)*

3. *L. amphineum*, (Ach.) Nyl. *olivaceous or fusco-virescent*, *adnate*, slightly spread about or subcrustæform, unequal, scarcely truly lobate; *apothecia obscurely rufescent*, *small*, *somewhat concave;* spores 8, colourless, ellipsoid or ellipsoideo-ovoid, 3-septate and variously divided.

On the earth, sparingly. 1872.

SYN :—Nyl. Scand. 32. (1861); Crombie in Journ. Bot. n. s. 2. 133.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—1...5.
ENGLAND :—Newlyn Cliff! near Penzance, Cornwall. *Mr Curnow.* near Stroud, Gloucestershire. *Mr. Joshua.*
"Spores .023—27 mm. long. .009—.011 mm. broad." *(Nyl.)*

4. *L. rhyparodes*, Nyl. *fuscous* or *fusco-nigrescent*, *furfuraceous*, thin, or subgranulose, diffuse, vinous-red with iodine; *apothecia concolorous* or rarely rufescent, small, somewhat plain and eventually *biatorine*; spores 8, colourless, ovoid, one or both apices attenuate, submurali-divided; paraphyses slender; gelatina hymenea blue with iodine.

On alpine rocks, rare. 1863.

SYN :—Nyl. in Flora 1857. p. 210. Carroll in Seem. Journ. Bot. 3. 287. C. *psorellum*, Leight. Lich. Fl. 2d ed. p. 26.
BOT. PROV :—15.
SCOTLAND :—Near summit of Ben Lawers! *Adm. Jones.* (1864). Above Lochna-cat. *Rev. J. M. Crombie.*
Crombie l.c. says "in its less developed and more obscure state, as on the summit of Ben Lawers, originally named by Nylander *Collema psorellum*. Flora 1865. p. 602."

5. *L. tenuissimum*, (Dicks.) *fusco-virescent*, imbricated, *microphylline*, *digitato-multifid*, *laciniæ linear*, unequal, subciliate; *apothecia* biatorine, *urceolate*, *margin entire*, thick, *paler*; spores 8, colourless, ovoid or oblong, irregularly murali-locular.

On mossy earth, not common. 1782.

SYN :—Dicks. Br. Crypt. 1. 12. (1875); Nyl. Scand. 33. *L. spongiosum*, Nyl. Scand. 33. (not *tenuissimum*, Nyl. Scand. 34.)

FIG :—Dicks. l. c. t. 2. f. 8. Nyl. Syn. t. 4. f. 10.
EXS :—Schær. 408. Hepp 211. Mudd 4.
GEOG. DISTRIB :—France, Sweden, Finland, Germany.
BOT. PROV :—1, 2...4, 5 ..7...10...15...19...28.
ENGLAND :—Norwich. *Mr. Crowe.* (1782). Ditchingham, Norfolk. *Mr. Woodward.* near Yarmouth. *Mr. D. Turner.* near Easby ! Cleveland. *Mr. Mudd.* Sidmouth. *Rev. T. Salwey.* Twineham, Sussex. *Mr. Borrer.* near Hastings ; and Shanklin, Isle of Wight. *Dr. Holl.* Inworth, Essex. *Mr. Varenne.* near Stonehouse, Gloucestershire. *Mr. Joshua.*
SCOTLAND :—Forfarshire. *Mr. W. Gardiner.*
IRELAND :—Midleton, near Cork. *Mr. Carroll.* Armagh. *Adm. Jones.*
WALES :—Crib-y Ddescil, and Clogwyn-y-Garnedd, Snowdon. *Mr. Griffith.* Glyder Vach. *Mr. Lees.*
"Spores .024—34 mm. long. .011—13 mm. broad." *(Nyl.)*

6. *L. fragile*, (Tayl.) *dark-olive* or *fusco-olivaceous*, firm, *laciniato-lobate, rosulate, lobes radiate, crenate, convex, granuloso-unequal ;* granula gonima variously dispersed, rarely moniliform ; *apothecia* pale brown, *urceolato-innate*, at length nearly plane, thalline margin thickish ; spores 8, colourless, ovoid, variously divided.

On sub-alpine calcareous rocks, very rare.

SYN :—*Collema*, Tayl. Fl. Hib. 2. 109 ; *Leptogium*, Nyl. Syn. 120.
EXS :—Arn. 156.
BOT. PROV :—19
IRELAND :—Dunkerron. *Dr. Taylor.*
Crombie l.c. remarks that "this rare Irish species is externally somewhat similar to young states of *Collema multipartitum*, but the character of the cortical stratum and of the apothecia is widely different."
"Spores .029 mm. long. .013 mm. broad." *(Nyl.)*

7. *L. cretaceum*, Sm. *olivaceo-fuscous* or olive-brown, *microphylline, rosulato-lobulate* or *stellato-laciniate*, lobes unequally crenate, somewhat imbricate ; granula gonima simple, rarely moniliform ; cortical layer rather indistinct ; *apothecia rufous*, nearly biatorine, *concave* or *gyalectiform*, small, margin paler ; spores 8, colourless, ovoid, variously divided, 3-7-septate, with longitudinal septa.

On chalk and flint, excessively rare. 1800.

SYN : —Sm. E. Bot. 738. (1800) ; Ach. Syn. 318. Nyl. Syn. 120.
FIG :—E. Bot. t. 738.
GEOG. DISTRIB :—France.
BOT. PROV :—2, 3, 4, 5.
ENGLAND :—Eastern Counties. *Dr. Nochden.* (1800). Kent and Sussex. *Rev. J. M. Crombie.* Reigate Hill, Surrey, near Cirencester. *Mr. Joshua.* On the Undercliff, near Folkestone, Kent. *Mr. Holmes.* near Lewes, Sussex. *Mr. Unwin.*
"Spores .022—40 mm. long. .011—17 mm. broad." (*Nyl.*)

8. *L. pusillum*, Nyl. *olivaceo-fuscescent* or virescenti-fuscous, *most minute, adnate, lobulato-granulose;* granula gonima few, moniliform ; cortical layer rather indistinct ; *apothecia rufescent, minute, elevated*, prominent, in a thalline excipulum whose margin is concolorous with the epithecium ; spores 8, colourless, ovoid, or narrower at either apex, 3-4-septate.

On old walls, very rare. 1867.

SYN :—Nyl. Syn. 121. (1861) ; Scand. 33. Crombie En. 7.
EXS :—(*forma effusa*) Arn. 356 Larbal. 54.
GEOG. DISTRIB :—Sweden, Germany.
BOT. PROV :—1...5...31.
ENGLAND :—(*Forma effusa,*) Bath. *Dr. Holl.* near Cirencester. *Mr. Joshua.*

CHANNEL ISLANDS :—*(forma effusa)* St. Brelade's! St. Peter's, Jersey. *Mr. Larbalestier.* (1867.)

Crombie l.c. remarks that "the structure of the thallus is almost as in *L. biatorinum* and *L. microphyllum*, but distinguished from the former by the thalline excipulum and the character of the spores."

"Spores .018—26 mm. long. .008—.010 mm. broad." *(Nyl.)*

9. *L. lacerum*, (Ach.) *plumbeo-fuscescent*, membranaceous, *longitudinally rugulose* or plicatulate, *lacero-laciniate, margins ciliato-dentate or dentate and crisped;* apothecia pallido-rufous, moderate, rare, margin thick, smooth; spores 8, colourless, ovoid or narrower at either apex, murali-locular.

On mossy rocks and walls, frequent. 1741.

SYN :—Ach. Prodr. 133. (1798); Nyl. Syn. 122, Scand. 33.

FIG :—E. Bot. t. 1982. Nyl. Syn. t. 2. f. 6. Hepp Sporen. t. 106, f. 928.

EXS :—Schær. 404. Mudd 5, Zw. 172, M. & N. 1061. Anzi Langob. 11. Larbal. 4. Hepp 928.

GEOG. DISTRIB :—Central Europe, Germany, Austria, Sweden, Pyrenees, France, Italy, Algeria, N. America.

BOT. PROV :—1, 2, 3, 4, 5...7, 8...12, 13, 14, 15,...19...26, 27...30, 31,

ENGLAND .—Westmoreland. *Sir J. E. Smith.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Baysdale! Mulgrave Castle! Cleveland, Yorkshire, *Mr. Mudd.* Torquay! Devon. *Dr. Deakin.* Charnwood Forest! and Bardon Hill! Leicestershire. *Rev. A. Bloxam.* Whitestone Cliff! near Thirsk. *Mr. Baker.* Cutcombe! Somerset. *Rev. W. H. Coleman.* Near Linton! Devon. *Mr. Lees.* Cheddar; Eshing, near Godalming. *Mr. Borrer.* Budleigh Salterton. *Prof. Dickie.* near Shanklin, Isle of Wight. *Dr. Holl.* near Cirencester. *Mr. W. Joshua.* Hungershall Rocks, Kent. *Mr. Jenner.* Eynesford; Wrotham; Ightham; Folkestone, Kent. *Mr. Holmes.* Llanymynech Hill! Shropshire.

SCOTLAND :—Grampians. *Rev J. M. Crombie.* Den of Glammis; Den of Balthayock. *Mr. W. Gardiner.* High Ashes, Leith Hill. *Mr Borrer.* Craiglockhart, Edinburgh. *Dr. Greville.* Den of Glammis? Airlie; Glen Dole; Reeky Linn, Forfarshire. *Mr. W. Gardiner.* Grey Mare's Tail, Moffat. *Dr. Nichol.* Berwickshire! *Sir W. C. Trevelyan.*

IRELAND :—Common. *Mr. Carroll.* Benbulben! co. Sligo. *Dr. Moore.* Collin Glen! Belfast. *Dr. Dickie.* Killarney. *Dr. Carrington.* Ballynakill Churchyard walls! *Mr. Larbalestier.*

WALES :—Garn Dingle, Denbighshire, *Mr. Griffith.* The Torrent Walk, Dolgelley! *Mr. Lees.* Dollymellyn; Garth Isaf, Merionethshire. *Mr. Borrer.* Eglwyseg Rocks! Bettws-y-Coed! Tremadoc!

CHANNEL ISLANDS :—Quenvais, Jersey! *Mr Larbalestier.* Guernsey. *Rev. T. Salwey.*

"Spores .034—48 mm. long. .010—16 mm. broad." *(Nyl).*

Forma *fimbriatum*, Hoffm. (Fl. Germ. 104. Dill. t. 19. f. 31. c.) lobes broader and more entire, margins *densely fimbriate and ciliate, ciliæ excessively branched.*

Coln Rogers and Cowcombe Wood, near Cirencester. *Mr. W. Joshua.* Derryclare Island! co. Galway. *Mr. Larbalestier.* Killin. *Rev J. M. Crombie.*

"Probably not very rare, but scarcely ever seen in a fertile condition." *Crombie l. c.*

Var. *pulvinatum*, (Hffm.) dark brown, smaller, pulvinate, lobes minute, much crowded, denticulato-laciniate.

On mossy rocks, &c., not common.

SYN :—Hffm. Fl. Germ. 2. 1104. (1795).

EXS :—Schær. 406. M. & N. 637. Larbal. 55. Hepp 929.

GEOG. DISTRIB :—Scandinavia, Germany, Switzerland.

BOT. PROV :—5...7. 8...11, 12...16.. 28...30, 31.

ENGLAND :—Shropshire *Rev. T. Salwey.* White Ladies, Aston! and near Warndon! Worcester. *Dr. Holl.* Twycross! Leicestershire. *Rev. A. Bloxam.*

Teesdale. *Mr. Robertson.* Malvern Hills and near Ankerdine, Worcestershire. *Dr. Holl.* near Cirencester. *Mr. W. Joshua.* Alston, Cumberland. *Rev. W. Johnson.*

SCOTLAND :—Appin. *Rev. J. M. Crombie.*

IRELAND :—Armagh. *Adm. Jones.* Killarney. *Mr. Carroll.* Deer Park, Belfast ! *Prof. Dickie.*

WALES :—Dolgelley. *Dr. Holl.* Eglwyseg Rocks !

CHANNEL ISLANDS :—Quenvais, Jersey ; Herm ; *Mr. Larbalestier.*

Var. *lophœum*, Ach. thallus still smaller, elongated, ciliato-dissected or ramoso-fimbriate, sterile.

On mossy rocks &c., rare.

SYN.—Ach. L. U. 651. (1810) ; Syn. 324. Nyl. Syn. 122.

EXS :—Anzi Langob. 412 a.

GEOG. DISTRIB.—Italy, Russia.

BOT. PROV :—5...16 ..31.

ENGLAND :—Near Malvern, *Dr. Holl.* Cowcombe Wood, Gloucestershire. *Mr. Joshua.*

SCOTLAND :—Appin. *Rev. J. M. Crombie*

CHANNEL ISLANDS :—"Sparingly in Channel Islands." *Crombie.* l. c.

Var. *intermedium*, ARN., aspect intermediate between *lacerum* and *tremelloides.*

ENGLAND :—Near Chalford, Gloucestershire ; near Arundel, Sussex. *Mr. Joshua*

10. L. *subtile*, (Schrad.) *dark dull green, microphylline, laciniate, laciniæ variously dissected, narrow, elongato-lobate, imbricated*, internally entirely cellulose ; *apothecia* pallido-rufescent, small, concave, *gyalectoid*, margin thin, entire ; spores 8, colourless, ovoid, 3-5-septate with longitudinal septa.

On the earth, rare. 1791.

SYN :—Schrad. Spic. 95 (1794) ; Nyl. Syn. 121.

FIG :—E Bot. t 1008, Mudd Man t. 1. f. 8.

EXS :—Nyl. 2. Zw. 175.

GEOG. DISTRIB :—Central Europe.

BOT. PROV :—2, 3, 4, 5...10...19...31

ENGLAND :—Near Hale End, Walthamstow ; Epping Forest. *Mr. Edward Forster.* (1791). Coltishall, Norfolk. *Mr. D. Turner.* Shanklin, Isle of Wight. *Rev. T. Salwey.* near Ayton, Cleveland. *Mr. Mudd.* New Hall, Henfield, Sussex ! *Mr. Borrer.* Newbury, near Worcester. *Dr. Holl.* near Exeter. *Rev. J. M. Crombie.* near Wooton-under-Edge and Cowcombe Wood, Gloucestershire, *Mr. Joshua.* between Rusthall Common and the High Rocks near Tunbridge Wells. *Mr. Jenner.* near Halstead ; between Hadlow and Dunk's Green, Hythe, Kent. *Mr Holmes.*

SCOTLAND :—Reeky Linn, Forfarshire. *Mr. W. Gardiner.*

IRELAND :—"On wet clay, not uncommon" *Dr. Taylor.*

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*, Bonne Nuit, Jersey. *Mr. Larbalestier.*

Crombie l. c. remarks, "Must carefully be distinguished from *L. tenuissimum* and all the somewhat similar states of *L. lacerum.*"

"Spores .020—23 mm. long. .010 mm. broad." *(Nyl.)*

Forma *latiusculum*, Nyl. laciniæ broader.

On banks, rare. 1875.

ENGLAND :—Near Stonehouse, Gloucestershire, *Mr. Joshua.*

11. *L. sinuatum*, (Huds.) *plumbeo-fuscescent, rotundato-lobate, reticulato-rugulose, lobes* crowded, *rounded*, imbricate, *margin entire or crenate*, suberect ; apothecia brown, scattered, minute, sessile, concave, margin smooth, entire, elevated ; spores 8, colourless, oblong, attenuated at the apices, irregularly murali-locular.

On old mossy walls in upland limestone districts, rare. 1741.

SYN :—Huds. Fl. Angl. 535. (1778); *Collema scotinum*, Ach. Syn. 323. Nyl. Syn. 123. Scand. 34.

FIG :—E. Bot. t. 772. Hepp Sporen t. 74. f. 653.

EXS :—Nyl. 101. M. & N. 1332. Mudd. 6. Schær. 405. Hepp 653 Zw. 171.

GEOG. DISTRIB :—Europe, Scandinavia, Sweden, Finland, Austria, Germany, Algeria, New Zealand.

BOT. PROV :—1 ..3, 4, 5...7, 8...11...14, 15, 16 ..19, 20.. 28...30.

ENGLAND :—Near Wigmore, Herefordshire, *Mr. Littleton Brown.* (1741). Ashburton, Devon. *Mr. Hudson.* Chagford, Devon. *Mr. Newberry.* Burgh Castle, near Yarmouth. *Mr. D. Turner.* Stanhope, Durham. *Mr. Mudd*, near High Force Inn. Teesdale, *Dr. Holl.* Pentregaer, near Oswestry ! *Rev. T. Salwey.* Chance's Rocks. Malvern Hills ! *Mr. Lees.* Matlock ! Derbyshire. *Prof. C. Babington.* near Buxton, and Hales End ! Worcester. *Dr. Holl.* Budleigh Salterton. *Prof. Dickie*, Hassock's Gate, Sussex. *Mr. Larbalestier.* Harley Wood, near Cirencester and Chew Magna. *Mr. W. Joshua.* Wye; between Deal and Sandwich, Kent. *Mr. Holmes.*

SCOTLAND :—Appin; Lochaber. *Rev. J. M. Crombie.* near Aberdeen ! *Dr. Dickie.* Gare Loch ! Dunbar. *Prof. Ch. Babington.* Ben Lawers. *Dr. Holl.*

IRELAND :—Armagh. *Adm. Jones.* Belfast. *Mr. Templeton.* Bantry. *Miss Hutchins.* Dunkerron. *Dr. Taylor.* Cork. *Mr. Carroll.*

WALES :—Garn Denbighshire. *Mr. Griffith.* Barmouth !

"Spores .024—41 long, .008—.016 mm. broad." (*Nyl.*)

Forma *Polinieri*, (Del.) thallus bright green.

IRELAND :—Rare, on Dunkerron and near Cork. *Crombie l.c.*

Var. *crenulatum*, (Nyl.) thallus smaller, its margins crenato-incised. Intermediate between the type and *L. lacerum*.

On trees.

SYN :—*L. fragrans.* Mudd Man. 46.

ENGLAND :—Near Ayton, Cleveland. *Mudd. Herb.*

12. *L. fragrans*, (Sm.) *olivaceo-fuscous* or virescent or nigricant, *rotundato-lobate, lobes* minute, *ascending*, crowded, smooth, *margins thickened, crenate; apothecia tawny-brown*, scattered, minute, sessile, convex, *margin entire, thick, tumid;* spores 8, colourless, ovato-subpyriform, 3-5-septate, irregularly murali-locular.

On old trees, not common. 1808.

SYN :—Sm. E. Bot. 1912. (1808).

FIG :—E. Bot. t. 1912.

BOT. PROV :—2, 3,...5..10.

ENGLAND :—Kent, Surrey, ; near Blaxton, Bilsborough Lane, Woodmancote, Henfield, and Hurstpierpoint, Sussex. *Mr. Borrer.* (1808) near Ayton, Cleveland. *Mr. Mudd.* Pembridge, Herefordshire. *Rev. J. F. Crouch.* Forthampton, Gloucestershire. *Mr. Lees.* Llanforda and Pentregaer, near Oswestry. *Rev. T. Salwey.*

13. *L. plicatile*, (Ach.) *fusco-virescent, imbricato-lobate, lobes erect* or ascending, *acutely plicate, crisped at the margin; apothecia* rufescent, scattered, *entirely margined by the thallus; spores* 8, colourless, *broadly fusiformi-ellipsoid*, generally 3-septate; gelatina hymenea blue with iodine; spermatia incrassate at either apex.

On maritime rocks, not unfrequent. 1811.

SYN :—Ach. Syn. 314. pro. p. (1817); Nyl. Syn. 109. *L. firmum*, Nyl. Scand. 34.

FIG :—E. Bot. t. 2348.

GEOG. DISTRIB :—Central Europe, Norway, Sweden, Algeria.

BOT. PROV :—1, 2...5..7.. 16 19.. 31.

ENGLAND :—Southover; Lewes; Old Shoreham; St. Michael's Tor, near Torquay; Steyning; Albourne. *Mr. Borrer.* Aston Keynes, Gloucestershire. *Mr. Joshua.* near Boxley Hill, Maidstone; Broughton Monchelsea; near Fant Woods and Banning, near Maidstone, Kent. *Mr. Holmes.*

SCOTLAND :—Appin. *Rev. J. M. Crombie.*
IRELAND :—Killarney. *Mr. Hardy.*
WALES :—North Wales. *Mr. Griffith.* (1811). Barmouth.
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey, rare. *Mr. Larbalestier.*

Forma *minor*, Crombie l. c. "thallus smaller, when dry somewhat angulose, probably identical with *Collema fasciculare*, Smmrf."

SYN :—*Collema fluviatile*, Taylor in Hb. Brit. Mus. & Kew.

14. *L. palmatum*, (Huds.) *fuscescent, fusco-cinerascent or fusco-glaucescent*, thin, membranous, *laciniate*, laciniæ erect, sublinear, *corniculato-convolute ;* apothecia rufescent, small, sessile, irregularly scattered, concave, margin elevated, entire ; spores 8, colourless, ellipsoid, attenuated at the apices, irregularly murali-locular.

On mossy sandy ground, rare. 1696.

SYN :—Huds. Fl. Ang. 536. (1778) ; Ach. Syn. 319. Nyl. Syn. 126. Scand. 35.
FIG :—E. Bot. t. 1635.
EXS :—M. & N. 1051. Hepp 921.
GEOG. DISTRIB :—Central Europe, France, Germany, Switzerland, Sweden, Algeria, Canaries.
BOT. PROV :—2, 3, 4...10...15...22...28...31.
ENGLAND :—Yarmouth ; Hemsley. *Mr. D. Turner.* Coatham ! Cleveland. *Mr. Mudd.* Cobham, Surrey ; Barrow Hill, Henfield. *Mr. Borrer.*
SCOTLAND :—Braemar ! *Prof. Churchill Babington.* Sands of Barrie. *Adm. Jones.* Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—Luggelaw, co. Wicklow. *Dr. Moore.* Armagh. *Adm. Jones.*
CHANNEL ISLANDS :- Guernsey ! *Mrs. Collings.* Herm. *Mr. Larbalestier.*
Crombie l.c. remarks "easily distinguished from *L. sinuatum* by the revolute margins of the laciniæ, most visible when moistened and which are either broader or narrower, and linear." "Spores .028—40. mm. long. .016—18 mm. broad." *(Nyl.)*

15. *L. tremelloides*, (L.) *plumbeo-glaucescent* or *plumbeo-olivaceous, thin, membranaceous*, smooth, *lobate, imbricated and crispate ; apothecia rufous* or rufescent, *elevated, urceolate* or *plane, margin* thick, entire, elevated, *lead-coloured ;* spores 8, colourless, ellipsoid, 3-septate, irregularly murali-locular.

On sub-alpine and maritime rocks, frequent. 1782.

SYN :—Linn. Suppl. Pl. 450. (1781) ; Ach. Syn. 325. Nyl. Syn. 124. Scand. 35.
FIG :—E. Bot. t. 1981. Nyl. Syn. t. 2. f. 7.
EXS :—M. & N. 1060. Schær. 409. Anzi Langob. 10. Lindig. 46. Larb. 5.
GEOG. DISTRIB :—Central Europe, France, Italy, Scandinavia, Sweden, Finland, Cuba, Amazons, N. Zealand, Ceylon, Rio de Janeiro, N. Granada.
BOT. PROV :—1 ..5, 6, 7...10...14, 15, 16...19 . 26...29, 30, 31.
ENGLAND :—Devonshire. *Mr Slater.* Yorkshire. *Mr. Curtis.* Whitcliff Rocks ! Ludlow. *Rev. T. Salwey.* Ruan Minor, Cornwall ; North Brent Tor, Dartmoor. *Mr. Borrer.* Hornby, Yorkshire. *Mr. Teesdale.* Torquay. *Dr. Holl.* Hayle Towan near Penzance ! *Mr. Curnow.* between Moreton and Bovey Tracy ; Ilsington, Devon. *Messrs. Jones & Kingston.*
SCOTLAND :—Dumbarton Castle Rock. *Sir J. E. Smith.* (1782). Inverary. *Mr. Borrer.* Pentland Hills. *Dr. Greville.* Appin. S. Hebrides. *Rev. J. M. Crombie.*
IRELAND :—Belfast. *Mr. Templeton.* Dargle River. *Dr. Stokes.* Bantry. *Miss Hutchins.* Askew Wood, Kerry. *Dr. Taylor.* Blackwater Bridge, Kerry ; Killarney. *Mr. Carrol.* Dunfanahy co. Donegal ; Moyne Abbey co. Mayo ! *Dr. Dickie.* Tullywee Bridge ! co. Galway. *Mr. Larbalestier.*
WALES :—Garn, Denbighshire. *Mr. Griffith.* Hendremynach. *Rev. T. Salwey.* Cwm Bychan, near Harlech. *Mr. Borrer.* Bishopston Glen, Glamorganshire ! Harlech Castle !
CHANNEL ISLANDS :—Gargate Mill ! St. Peter's Valley ! Jersey. *Mr. Larbalestier.*
"Spores 021—.027—mm. long. .008—9 mm. broad." *(Nyl.)*

*F. polyphyllum*, Nyl. rocks Doughruagh, very rare. 1876. *Mr. Larbalestier.*

16. *L. dermatinum*, Borr. *olive-green* or *olive-brown, subcoriaceous*, rotundo-lobate; *margins ascending, sinuate* or *inciso-crenate*, smooth or minutely granulate; *apothecia rufous*, plane, margin narrow, entire or minutely crenulate; spores 8, colourless, ellipsoid, 3-septate, murali-locular.

On calcareous rocks, not common.

SYN :—Borr. in E. Bot. Suppl. t. 2716. (1831).
FIG :—E. Bot. Suppl. t. 2716, f. 2.
BOT. PROV :—1, 2...5, 6, 7 . 10...12...26.
ENGLAND :—Leigh Wood, near Bristol. *Mr. Forster.* Keswick; Malham Cove, Yorkshire; New Timber Hill, Sussex. *Mr. Borrer.* Westmoreland. *Mr. Robertson.* Pentregaer, Oswestry. *Rev. T. Salwey.* Devonshire. *Sir W. J. Hooker.* Barnsley Park, near Cirencester. *Mr. Joshua.* Swinnop, East Allandale, Northumberland, and Alston, Cumberland. *Rev. W. Johnson.* Ewen Lane, near Cirencester. *Mr. W. Joshua.*
SCOTLAND :—*Mr. Borrer.*
IRELAND :—Tulleywee Bridge, Galway. *Mr Larbalestier.*
WALES :—Limestone Rocks! *Mr. Griffith in Herb. Borrer.* Stackpole, Pembrokeshire. *Rev. T. Salwey.*

17. *L. fluviatile*, (Huds.) *dark olive or olive-black, coriaceo-membranaceous, laxly imbricated*, lobate, *lobes oblong or obovate, convex, proliferous, canaliculate beneath; apothecia* brown, small, *globular*, sessile, *concave*, thalline margin smooth, pale; spores 8, colourless, obovate, 3-septate, irregularly murali-locular.

On rocks in mountain streams, rare. 1724.

SYN :- Hudson Fl. Ang. 534. Ach. Syn. 314. Mudd Man. 40. *C. rivulare*, Ach. Syn. 326.
FIG :—E. Bot. t. 2039.
BOT. PROV : -7...10...13...15.
ENGLAND :—Malham Cove, Yorkshire. *Dr. Richardson.* (1724)
SCOTLAND :—River Isla in Clova. *Rev. J. M. Crombie.* Bonnington Fall, Lanark. *Mr. Borrer.*
WALES :—Snowdon. *Dillenius.* In River Elwy, about half way from the ford opposite the cave to Pont-Newydd, 4 miles from Denbigh. *Mr. Griffith.*
"Spores .016—23 mm. long, .007—9 mm. broad." *(Nyl).*

18. *L. chloromelum*, (Sw.) *lead-coloured* or *plumbeo-virescent*, membranaceous, *lobate, plicate, longitudinally rugose*, lobes undulate; *apothecia rufous* or fuscorufous, concave or plane, *thalline margin* thick, *rugoso-plicate* or *furfuraceo-granulate*; spores 8, colourless, ellipsoid, attenuated at either apex, 3-5-septate, with longitudinal septa.

On mossy trunks in sub-alpine regions, rare.

SYN :—Swartz Fl. Ind. Occid. 3. 1892. (1806); Ach. Syn. 321. Nyl. Syn 128.
EXS :—Wright 8.
GEOG. DISTRIB :—W. Europe, France, Canaries, E. & W. Indies. N. Zealand. Jamaica, Mexico, Brazil, Cuba, Teneriffe.
BOT. PROV :—2...7...19
ENGLAND :—Charlton Forest, Sussex. *Mr. Borrer.*
IRELAND :—Killarney and Southern counties. *Miss Hutchins.*
WALES :—Barmouth. *Rev. T. Salwey.* Garth, near Dolgelly. *Dr. Holl.*
"Spores. 020—37 mm. long. .010—17 mm. broad." *(Nyl.).*

19. *L. saturninum*, (Dicks.) *plumbeo-fuscescent* or *olivaceo-fuscous, monophyllous and lobato-incised*, or *polyphyllous and*

*complicate, sinuate and plicate, nigricanti-furfuraceous above, beneath cinereous* or *albo-cinereous and densely incano-tomentellose*; apothecia dark-rufous, scattered, plane, thalline receptacle cupular and prominent, margin entire; spores 8, colourless, ellipsoid, 3-septate.

On old trunks in sub-alpine localities, rare. 1790.

SYN :—Dicks. Br. Crypt. 2. p. 21. (1790); Ach. Syn. 320. Nyl. Syn. 127.
FIG :—Dicks. l. c. t. 6. f. 8. E. Bot. t. 1980. Nyl. Syn. t. 4. f. 16. Hepp Sporen t. 74. f. 652.
EXS :—M. & N. 454. in part. Schær. 424. 500. Anzi Langob. 9. B. 292. Hepp 652.
GEOG. DISTRIB :—Europe, Pyrenees, Italy, Bavaria, Switzerland, Scandinavia, Sweden, E. Lapland, Hungary, Austria, N. America.
BOT. PROV :—11...15, 16.
ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.*
SCOTLAND :—Western parts, *Mr. Dickson*, (1790). Killin. *Mr. D. Turner.* Appin. *Rev. J. M. Crombie.* near Aberdeen! *Prof. Dickie.* Glen Lyon and Glen Lochy, Perthshire. *Dr. Holl.* Forfarshire. *Mr. G. Don.*
"Spores .020—22 mm. long, .010—11 mm. broad." *(Nyl.)*

20. *L. Burgessii*, (Lightf.) *dark lead-colour* or *plumbeo-fuscescent*, large, *laciniato-lobate, complicate, lobes crenulate* or *variously dissected, curled and crispate beneath, cinerascent and minutely albido-tomentellose;* apothecia dark-rufous, large, plane or concave, *thalline margin subfoliaceous, densely sinuato-laciniate and crispate*; spores 8, colourless, ellipsoid, attenuated or apiculate at either apex, 3-5-septate and irregularly murali-locular.

On calcareous rocks and old trunks in sub-alpine regions, rare. 1774.

SYN :—Lightf. Fl. Scot. 827. (1777); Ach. Syn. 320. Nyl. Syn. 132.
FIG :—Lightf. l. c. t. 26. E. Bot. t. 300. Hepp Sporen t. 106. f. 927.
EXS :—Hepp 927. Maudon 35.
GEOG. DISTRIB :—Denmark, Switzerland, Canaries, America, Amazons, Madeira.
BOT. PROV :—6, 7...12, 13...15, 16...19...26...30.
ENGLAND :—Cumberland! *Dr. Burgess.* Gowbarrow Park! and Keswick! *Mrs Stanger.*
SCOTLAND :—On bank of rivulet Duff-Kinnel, near Barntimpen, par. Kirkpatrick; and in Mollin Linn Wood! par. Johnstone. Dumfriesshire. *Rev. Dr. Burgess.* (1774) Scotch Highlands. *Sir W. J. Hooker.* Grampians. *Rev. J. M. Crombie.* Inverary! *Mr. Bentham.* Glen Falloch. *Dr. Holl.*
IRELAND :—Killarney. *Dr. Taylor.* Deer Park, Antrim. *Dr. Moore.* S. side Kylemore lake. *Mr. Larbalestier.*
WALES :—Devil's Bridge and Hafod, Cardiganshire. *Sir J. E. Smith.* Abertygwyn, near Dolgelley. *Dr. Holl.* Garth and Rhaiadr Du, near Barmouth. *Rev. T. Salwey.* Bettws-y-coed!
"Spores .030—40 mm. long, .013—17 mm. broad." *(Nyl.)*

21. *L. turgidum*, (Ach.) *dark olive-green, thick, rotundato-lobate*, smooth or granulated, *lobes turgid*, ascending and *imbricated in the centre, concave, undulate and plicate at the circumference;* apothecia reddish-brown or nigricant, moderate, plane; *margin thick, turgid, more or less granulate;* spores 8, colourless, oblong or ovato-oblong, 3-septate.

On rocks and sandstone walls, not common.

SYN :—Ach. L. U. 634. (1810). Syn. 313. Nyl. Scand. 36.
EXS :—Schær. 433. Hepp 215. Leight. 257.
GEOG. DISTRIB :—France, Switzerland.
BOT. PROV :—3, 4, 5...10...12.

ENGLAND :—Near Scarborough. *Mr. Hailstone.* Malham, Yorkshire. *Dr. Carrington.* Leigh Woods! Clifton. *Mr. Larbalestier.* Gorlestone Church; Dunwich, Suffolk. *Mr. D. Turner.* Southover Priory. *Mr. Jenner.* between Horsham and Guildford. *Mr. Borrer.* near Malvern. *Dr. Holl.* Chewmagna near Bristol; Wootton under Edge, and Sevenhampton. *Mr. Joshua.* Newington near Sandgate; near Maidstone; Wrotham; Westerham; Postling; Kent. *Mr. Holmes.* Foreshield, Alston, Cumberland. *Rev. W. Johnson.* Upton, near Shiffnal, Shropshire; Llanforda, near Oswestry.

Crombie l. c. remarks, "confined apparently to S. and W. England, easily recognised from all states of *Collema pulposum* and *L. plicatile*, by its subfruticulose habit."

22. *L. Schraderi*, (Bernh.) *darkish olive-green, cæspitose, small,* erect, *dichotomously branched, lobes sublinear,* irregularly undulato-sulcato-rugose and angular, *constricted at the base and apices, dilated in the middle*; apothecia reddish, lateral, concave, margin entire, paler.

Among mosses in calcareous soil, rare. 1783.

SYN :—Bernh. in Schrad. Journ. 1799. fasc. 1. 22. Ach. Syn. 328. Nyl. Syn. 133.

FIG :—E. Bot. t. 2284.

GEOG. DISTRIB :—France, Germany, Bavaria, Algeria.

BOT. PROV ;—1, 2...4, 5...8...15...19...26...28.

ENGLAND :—Matlock, Derbyshire. *Sir J. E. Smith.* (1783). Caistor Church, Norfolk; and near Bury; and Sussex. *Mr. D. Turner.* near Yarmouth; Bath. *Rev. J. M. Crombie.* Holly Bush Hill, Malvern. *Dr. Holl.* near Storrington Church; Crow Link, Sussex. *Mr. Borrer.* Sussex Downs, near Brighton; near Bath; near Babbicombe S. Devon; Shanklin, Isle of Wight. *Dr. Holl.* Grove Lane, near Cirencester. *Mr. W. Joshua.* Bathampton Downs, Bath. *Dr. Holl.* near Chelsfield; Wrotham; Shoreham; Folkestone; near Otford, Kent. *Mr. Holmes.*

SCOTLAND :—On decayed mortar of old walls in Glenlyon, Perthshire. *Rev. J. M. Crombie.*

IRELAND :—Killarney. *Dr. Moore.* near Cork. *Mr. Carroll.* Sheep Walk, Armagh. *Adm. Jones.* Dawros Bridge, near Kylemore, Galway. *Mr. Larbalestier.*

CHANNEL ISLANDS :—L'etacq, Jersey; Herm. *Mr. Larbalestier.*

23. *L. microscopicum*, Nyl. olivaceo-nigricant, most minutely fruticulose, effuse, branched, erect, unequally terete, branchlets elongato-papillate.

On rocks, rare.

SYN : -Nyl. Prodr. 26. Syn. 122.

FIG :—Nyl. Syn. t. 4. f. 17.

BOT. PROV :—3...5...31.

ENGLAND :—Cowcombe Wood. near Chalford, Gloucestershire. *Mr. Joshua.* Fant Woods, near Maidstone, Kent. *Mr. Holmes.* Llanymynech! Shropshire.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

Crombie says l.c. "approaches, in habit at least, nearer to the preceding than to any state of *L. lacerum*, while the discovery of the apothecia by me recently, near Shiere, in Surrey, shows that it is not, as might have been suspected, an undeveloped state of some other species."

24. *L. musicolum*, (Sw.) *fuscous*, or *olivaceo-fuscescent*, small, *pulvinar, fruticuloso-ramose*, branches *filiformi-terete* or *sub-compressed, intricate*, apices slightly attenuate; *apothecia* fusco-rufescent or fuscous, *terminal, appressed*, concave, margin thin, smooth, entire, paler; spores 8, colourless, oblongo-fusiform, 1-septate.

On mossy rocks and walls in sub-alpine districts, rare. 1790.

SYN :—Swartz Nat. Act. Ups. 4. 248 (1784); Ach. Syn. 328. Nyl. Syn. 134. Scand. 36.

FIG :—Dicks. Br. Crypt. 2. t. 6. f. 9. Schær. En. t. 10. f. 1. b. E. Bot. t. 2264. Nyl. Syn. t. 4. f. 11...15.

Exs :—Zw. 175. M. & N. 949. Schær. 403. Leight. 395. Anzi Langob. 12. Fellm. 11.

Geog. Distrib :—Europe, France, Scandinavia, Sweden, Russia, Pyrenees, Germany, Italy, Algeria.

Bot. Prov :—1...5...7...10, 11...15...22...31.

England :—Eglestone, Durham. *Rev. J. Harriman.* Oswestry. *Rev. T. Salwey.* Lanbraughrigg, Cleveland. *Mr. Mudd.* Blackstone Rock, Dartmoor. *Prof. Dickie.* South Brent, Devon. *Dr. Holl.*

Scotland :—Scotch Alps. *Mr. Dickson.* (1790). Grampians. *Rev. J. M. Crombie.* Ben Lawers ; Loch Dochart, Perthshire. *Dr. Holl.*

Ireland :—Luggelaw, co. Wicklow. *Adm. Jones.*

Wales :—Garthmeilio. *Mr. Griffith.* Barmouth ! Cross Foxes ! near Dolgelley ; Craig Breidden !

Channel Islands :—Guernsey. *Rev. T. Salwey.* Quenvais, Jersey. *Mr. Larbalestier.*

"Spores .023—27 mm. long, .007 mm. broad." (*Nyl.*)

## V. COLLEMOPSIS. *Nyl.*

Thallus internally glaucous-green. Gonimia submoniliformly arranged.

1. *C. Schœrerii*, (Mass.) *fusco-cinerascent or cinereo-nigrescent*, subtartareous, effuse, thinly *scobiformi-granulate, subareolate, subspongiose ; apothecia atrorufous* or *dark blue*, very minute, crowded, *globoso-truncate, punctiformi-impressed, then disciformi-dilated*, margined ; spores 8, colourless, globoso-ovoid, simple.

On calcareous rocks, rare.

Syn :—Stizb. Flecht. 141. Crombie En. 2.
Fig :—Hepp Sporen t. 57. f. 496.
Exs :—Anzi 430. Zw. 250. 254. Mass. 338.
Geog. Distrib :—Europe.
Bot. Prov :—3...5..15.
England :—Shiere, Surrey. *Rev. J. M. Crombie.* Cowcombe Wood, near Chalford, Gloucestershire. *Mr. Joshua.* Boxley Hill, near Maidstone ; near Kemsing, Kent. *Mr. Holmes.*
Scotland :—Craig Guie, Braemar, Craig Tulloch, (900 ft.) Blair Athole. *Rev. J. M. Crombie.*

"Absence of any proper hypothallus at once separates it from *Pannaria*, which otherwise it closely resembles." *Crombie.* l. c.

2. *C. lecanopsoides*, Nyl. *fuscous-black*, opake, thin, *granuloso-areolate* or nearly continuous, *somewhat scabrous ; apothecia* concolorous, *urceolate*, thalline *margin* prominent, *connivent ;* spores 4-8, colourless, ellipsoid, simple ; paraphyses slender, not crowded.

On maritime calcareous rocks, rare. 1866.

Syn :—Nyl. in Flora, 1866, p. 374. *Collema pyrenopsoides*, Nyl. Syn. 1. 103.
Geog. Distrib :—Pyrenees.
Bot. Prov :—15...19.
Scotland :—Craig Tulloch. Blair Athole. *Rev. J. M. Crombie.*
Ireland :—Kenmare, Kerry. *Adm. Jones.* (1866).
"Spores .014—20 mm. long, .006—.010 mm. broad." (*Nyl.*)

3. *C. furfurella*, Nyl. black or fuscous-black, either entirely *furfuraceo-granulose* and effuse, or *dispersed in small furfuraceous verrucæ, with larger convex fertile granules intermixed ; apothecia subpyrenodeo-lecanorine* impressed in the fertile granules ; spores 8, colourless, shortly ellipsoid, simple ; paraphyses distinct ; gelatina hymenea vinous-red with iodine ; spermatia oblongo-cylindrical.

On alpine rocks, very rare. 1865.

In external aspect like a *Pyrenopsis*, but with moniliform granula gonima.

SYN :—Nyl. in Sällsk. pro. F. et Fl. Fr. Notis. 4. (n. ser. 1.) p. 229. (1859); Scand. 28. Carroll in Seem. Journ. Bot. 3. 286.
GEOG. DISTRIB :—Finland, Sweden.
BOT. PROV :—15.
SCOTLAND :—Summit of Corbuie, in Bredalbane. *Adm. Jones.* (1865). Meal Girdy. *Rev. J. M. Crombie.*
"Spores .011—17 mm. long, .008—.011 mm. broad." *(Nyl.)*

4. *C. oblongans*, Nyl. olive-brownish, *granuloso-crustaceous*, thin, confluent; *apothecia* bright, or red-testaceous, somewhat *concave*, *minute*, margin thickish; spores 8, colourless, oblong, simple or spuriously 1-septate; gelatina hymenea I very faintly vinous-red.

On the ground, in fissures of rocks, 1874.

Allied to *C. Arnoldiana*, (Hepp) and *C. Flotowiana*, (Hepp), but differing in oblong shape of spores.
SYN :—Nyl. in Flora 1874. p. 305.
GEOG. DISTRIB :—Europe.
BOT. PROV :—12.
ENGLAND :—Near Haverbrack, Westmoreland. *Mr. Martindale.* (1874).
"Spores 0.016—30 mm. long, 0.006 mm. broad."

5. *C. diffundens*, Nyl. *black*, opake, thin, *areolato-squamulose*; *squamulæ* somewhat *chaffy*, small, variable, effuse; *apothecia rufescent*, *innate*, *often gyalectoid*, but variable, and somewhat plane, internally entirely pale; spores 8, colourless, ellipsoid, simple; paraphyses distinct, slender; gelatina hymenea at first blue then vinous-red with iodine.

On green-sand rocks, rare. 1865.
SYN :—Nyl. in Flora. 1865. p. 602. Crombie En. 3.
BOT. PROV :—3.
ENGLAND :—Near Maidstone, Kent. *Adm. Jones.* (1865).
"Spores .011—23 mm. long,.007—.011 mm. broad." *(Nyl.)*

6. *C. Arnoldiana*, Nyl. *olivaceo-fuscous*, thin, *granulose*; *apothecia rufous or dark rufous*, *biatorine*, *impressed almost gyalectiform in the centre*, small; paraphyses articulate; spores 8, colourless, ellipsoid, simple, containing minute oleose guttules, one larger.

In old oolite quarries, rare. 1875.
SYN :—*Leptogium*, Nyl. Syn. 118. (1860). *Verrucaria Flotoviana*, *Hepp.*
FIG :—Hepp Sporen t. 11. f. 92.
EXS :—Arn. 32. 33.
GEOG DISTRIB :—Europe.
BOT. PROV. :—3...5.
ENGLAND :—Cowcombe Wood, near Chalford, Gloucestershire. *Mr. Joshua*, Sheere, Surrey. *Rev. J. M. Crombie.*
"Spores .017—20 mm. long, .010—.0105 mm. broad. Gelatina hymenea I pale-blue then dilutely vinous-red." *(Nyl.)*

7. *C. leptogiella*, Nyl. *olivaceo-fuscous*, *slightly subcoralloideo-furfuraceous*, effuse; *apothecia testaceo-lurid*, *minute*, like those of a Leptogium; epithecium somewhat impressed or at length nearly plane, with a small margin; spores 8, colourless, ellipsoid or oblongo-ellipsoid; paraphyses slender, thicker at the apices.

On quartzose rocks, rare. 1876.
Spores .010—17 mm. long. .005—7 mm. broad. Gelatina hymenea I vinoso-fulvo-rubescent. A very peculiar species, resembling *Leptogium microscopicum.*
SYN :—Nyl. in Flora. 1877. p. 220.
BOT. PROV :—26.
IRELAND :—Lough Inagh, Connemara. *Mr. Larbalestier.* (1876).

## VI. PYRENIDIUM. *Nyl.*

Thallus minute, stellato-divided or cæspitellose or confluendo-effuse, of the same structure as that of *Leptogium*. Apothecia pyrenocarpous verrucarioid.

1. *P. actinellum*, Nyl. dark olivaceous, adnate, forming small patches, stellato-divided, rays distinct, attenuated at their apices, ascending or suberect, vinous-red with iodine; apothecia pyrenodeous, in the centre of the thallus, prominent, perithecium entirely black; spores 4, fuscous or fuscescent, oblong, 3-septate; paraphyses few, slender or obsolete.

On chalk, very rare. 1865.

SYN:—Nyl. in Flora 1865. p. 210.
BOT. PROV:—3...5.
ENGLAND:—Boxley Hill, Kent. *Adm. Jones.* (1865). Dorking. *Mr. Joshua.*
Crombie l. c. states that, "According to Nylander *in litt.*, if the apothecia are not parasitic, this ought to be included in a distinct tribe called *Pyrenidii.*"

## FAM: III. MYRIANGIACEI.

### TRIBE I. MYRIANGIEI.

## I. MYRIANGIUM. *Mnt. & Berk.*

Thallus black, noduloso-pulvinate, cellulose, unstratified. Apothecia sublecanorine, sphæroideo-cellulose. Spores 8, colourless, oblong, irregularly septate, or almost murali-divided.

1. *M. Duriæi*, M. & B. black, opake, small, tuberculato-glomerate or noduloso-confluent, often depresso-pulvinate; apothecia minute, black, slightly impressed; spores 8, colourless, oblong or oblongo-ovoid, variously septate; gelatina hymenea vinous with iodine.

On ash and elm, rare. 1836.

SYN:—Mnt. and Berk. in Hook. Journ. Bot. 1845, p. 73. Nyl. Syn. 139. *Collema glomerulosum*, Tayl. Fl. Hib. 2. 108. excl. syn.
FIG:—Nyl. Syn. t, 4. f. 1, 5.
EXS:—Mass. 37.
GEOG. DISTRIB:—Europe, France, Algeria, Mexico, Australia, N. America.
BOT. PROV:—1, 2...19...31.
ENGLAND:—Penzance. *Mr. Ralfs.* Isle of Wight. *Rev. T. Salwey.* near Shanklin. *Dr Holl.* Trevello Wood, Cornwall. *Mr. Curnow.*
IRELAND:—Carrigaline! near Cork; near Crosshaven, Cork. *Mr. Carroll.* Roughty, Kerry. *Dr. Taylor.* (1836).
CHANNEL ISLANDS:—Sark! *Rev. T. Salwey.*

## FAM: IV. LICHENACEI.

Thallus various in colour, white, whitish, cinerascent, flavicant, rufous, fuscous, and very rarely nigricant, and very various in form, filamentous, foliaceous, squamose, crustaceous, pulverulent or evanescent. In most species the stratum gonidiale formed of true gonidia, in a few only of granula gonima. Apothecia either stipitate or lecanorine or peltate, or patellulate, or pyrenocarpous.

### SERIES I. EPICONIODEI.

Apothecia with the spores naked, collected into a sporal mass on the surface. Spores 8, in asci.

## Tribe I. Caliciei.

Thallus crustaceous, granulose, or obsolete, yellow or flavo-vires cent or cinerascent or whitish. Apothecia cupuliform, constricted below into a stipes, or sessile.

### I. SPHINCTRINA. *Fr. pr. p. D.N.*

Thallus none. Apothecia parasitic on *Pertusariæ*, globoso-turbinate, shining, black, sessile or shortly stipitate. Spores nigrescent, simple.

1. *S. turbinata*, (Pers.) Apothecia *subsessile*, small; spores *small*, *globose* or subglobose; iodine pale blue, then obscured.

On *Pertusaria communis*, common. 1796.

Syn :—*Calicium turbinatum*, Pers. Fung. 59. Ach. Syn. 56. Nyl. Syn. 142. Mudd Man. 255.

Fig :—E. Bot. 2520. Nyl. Syn. Lich. t. 5. f, 1.

Exs : –Schær. 6. Leight. 132. Mudd 241. Anz. Ital. S. 46. Reich. & Schub. 2. M. & N. 366 left hand spec.

Geog. Distrib :—Europe, Scandinavia, Portugal, France, Algeria, North America.

Bot. Prov :—2, 3 5 .7...10 ..15...19.

England .—Near Guisbro ! Easby ! Yorkshire. *Mr. Mudd.* Powick, Worcestershire. *Mr. Lees.* near Oswestry, Shropshire. *Rev. T. Salwey.* Tunbridge-Wells. *Mr. Jenner.* Sibertswold, Kent. *Mr. Holmes.* Great Glenham, Suffolk, Guestling. Sussex. *Rev. E. N. Bloomfield.* Oakley Park, near Cirencester. *Mr. W. Joshua.* Aymestrey ! Hay Forest ! Herefordshire; Huglith ! near Church Stretton, Shropshire !

Scotland :—Northern parts. *Rev. J. M. Crombie.* Carse of Gowrie. *Mr. Bousie.*

Ireland :—Blarney, Cork ! *Mr Carroll.*

Channel Islands :—Rozel, Jersey, *Mr. Larbalestier.*

Wales :—Capel Curig ! Builth !

"Spores .001 to .00125 in. diam." *(Mudd.)* "Spores .003—6 mm diam." *(Nyl.)* Spores .005–6 mm. diam.

2. *S. anglica*, Nyl. apothecia *substipitate*, on *grey* thallus; spores *globose, ellipsoid and oblong, moderate*, iodine blue.

On old rails &c., rare. 1805.

Syn :—Nyl. Syn. Lich. 143. *Calicium microcephalum*, Sm. T. and B. Lich. 130. Mudd Man. 255.

Fig:—E. Bot. 1865. Nyl. Syn. t. 5. f. 3.

Exs :—Korb. 203. Rab. 562. Arn. 245. Zw. 285. Th. M. Fr. 72.

Geog. Distrib :—N. England. N. America.

Bot. Prov :—2...4, 5...8...20.

England :—Albourne ! Sussex; Caistor, near Yarmouth. *Mr. Borrer.* (1805.) Packington. *Countess of Aylesford.* Twycross ! Gopsall ! Leicestershire. *Rev. A. Bloxam.*

Ireland :—Curraghmore, near Waterford. *Adm. Jones.*

"Spores .00125 to .002 in. diam." *(Mudd.)* "Spores .008—.013 mm. long. .006—9 mm. broad." *(Nyl.)* Spores .009 mm. long, .008 mm. broad.

3. *S. microcephala*, Nyl. apothecia *sessile*, fuscescent; spores nigricant, *fusiformi-ellipsoid, simple, large*.

On Pertusariæ, rare. 1869.

Syn :—*S. microcephala*, Nyl. Calic. 6. Nyl. Syn. 144. Mudd Man. 256.

Fig :—Tul. Mem, Lich. t. 15. f. 20. Nyl. Syn. t. 5. f. 2.

Exs :—Nyl. 5. Hepp 551. M & N. 366. right hand spec.

Geog. Distrib :—Europe, France, Pyrenees, Ceylon, Madeira.

Bot. Prov :—2.

England :—New Forest, Hants. *Rev. J. M. Crombie.* (1869).

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .002 to .0025 in. long. by .0015 in. broad." *(Mudd.)* "Spores .011—16 mm. long. .007—8 mm. broad." *(Nyl.)* Spores .013—15 mm. long, .007—8 mm. broad.

## II. CALICIUM. *Ach. Nyl.*

Thallus granulose, powdery, squamulose or altogether evanescent. Apothecia black, stipitate or subsessile, capitula globose or turbinate or cupular. Spores fuscous or nigricant. Spermatia short, oblong.

### A. *Spores simple.*

1. *C. diploellum*, Nyl. obsolete; apothecia *black* very *shortly stipitate*, capitulum *turbinate, open*, sporal mass scarcely prominent; spores *nigrescent*, oblong, simple (or 1-septate.)

On holly, very rare. 1868.

The smallest of all the species, and easily recognized. Its place is near *disseminatum.*

SYN :—*C. diploellum*, Nyl. in Flora 1868. p. 161.
BOT. PROV :—19
IRELAND :—Cromaglown, Killarney. *Mr Carroll.*
"Spores .006–9 mm. long. .003 mm. broad." (*Nyl.*)

2. *C. chrysocephalum*, Ach. *citrine or yellow-green, granulate, verrucoso-conglomerate* or evanescent; apothecia black, shortly stipitate or elongate, capitula *turbinato-lentiform, citrino-suffused beneath and at margin;* sporal mass *umber* or ferruginous; spores fuscous, globose.

On palings, &c., rare. 1804.

SYN :—*C. chrysocephalum*, Ach. Meth. Suppl. 15. Syn. 60. Nyl. Syn. 146. Mudd Man. 261.
FIG :—E. Bot. 2501. Nyl. Syn. Lich. t. 5. f. 11, 12.
EXS :—Schær. 12. Nyl. 10. Hepp 329. Leight. 134. Mudd 251.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :–3, 4, 5...10...14.
ENGLAND :—Sotterley, Suffolk. *Mr. D. Turner*, (1804). Norfolk; Suffolk; Essex. *Sir W. J. Hooker.* Rosedale, and Baysdale, Cleveland, Yorkshire! *Mr. Mudd.* Shipbourne, Kent. *Mr. Jenner.* Downton Castle! Herefordshire.
SCOTLAND :—Near Slateford. *Dr. Greville.*
"Spores .0015 in. long. by .001 in. broad." *(Mudd.)* "Spores .003—6 mm. diam." *(Nyl.)*

*f. melanocephalum*, Nyl. apothecia *fasciculato-ramose*, stipes black, capitula black, *citrino-suffused at margin only;* spores globose or ellipsoid, pale-fuscous, larger.

SYN :—Nyl. Syn. 147.
FIG :—Nyl. l. c. t. 5. f. 19.
EXS :—Leight. 134 in part.
ENGLAND :—Downton Castle! Herefordshire, on same palings with common form.
"Spores .004—.016 mm. long. .004—8 mm. broad." *(Nyl.)*

3. *C. phæocephalum*, Borr. *pallido-cinerascent* or *darkly flavicant*, minutely *granuloso-squamuliform*, crenate, congested; apothecia with slender black or fuscous stipites, capitula *turbinato-lentiform, flavo-viridi-pruinose*, sporal mass *fuscous;* spores fuscescent, globose.

On boards, palings, &c., rare. 1807.

SYN :—*C. phæocephalum*, T. & B. Lich. Brit. 145. Ach. Syn. 61. Nyl. Syn. 147. Mudd. Man. 261.

FIG :—E. Bot. 1540. Nyl. Syn. t. 5. f. 13.
EXS :—Schær. 245. Rab. 592. Korb. 260. Zw. 242. A. B. C.
GEOG. DISTRIB. :—Scandinavia, Germany, Helvetia. N. America.
BOT. PROV.:—2, 3, 4, 5.
ENGLAND :—Lakenham, near Norwich. *Mr. D. Turner.* (1807). Hurstpierpoint, Sussex! *Mr. Borrer.* Bruisyard, Suffolk; Albourn, Sussex. *Sir W. J. Hooker.* Hay Park, near Ludlow. *Rev. T Salwey.* Cookhill Wood. Worcestershire. *Mr. Purton.* between Tunbridge-Wells Common and Hurst Wood, Kent. *Mr. Jenner.*
"Spores .001 in. diam." *(Mudd.)* "Spores .003—5 mm. diam." *(Nyl.)*

4. *C. aciculare*, (Sm.) *cinerascent*, very thin or obsolete; apothecia with *obconico-turbinate capitula flavoviridi-suffused*, sporal mass *brown, much protruded;* spores fuscescent, globose.

On oaks, firs, hollies, &c., rare. 1812.

SYN :—*Lichen acicularis*, Sm. E. Bot. 2385. Nyl. Syn. 148. *chorellum*, Mudd Man. 262.
FIG :—E. Bot. 2385. Nyl. Syn. t. 5. f. 14.
EXS :—Zw. 19. Leight. 170. Hepp 328. Nyl. 9. Mudd 252.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3. . 16...24.
ENGLAND :—Near Bury. *Rev. G. R. Leathes.* (1812). Sussex! *Mr. W. Borrer.* Brentsdale! Newton Wood, and Bousdale Gill! Yorkshire. *Mr. Mudd.* Esher, Surrey; Hurstpierpoint, Sussex. *Sir W. J. Hooker.*
IRELAND :—Tervoe, near Limerick! *Mr. Carroll.*
"Spores .001 in. diam." (*Mudd.*)

5. *C. trichiale*, Ach. flavido-cinerascent or cinereo-glaucescent, *minutely granuloso-squamulose;* apothecia black, stipes *slender*, capitula black, *globoso-lenticular, cinereo-suffused beneath*, sporal mass *umber, convex, or hemisphærical;* spores fuscescent, *sphærical, minute.*

On trees, timber ,&c., rare.

SYN :—*C. trichiale*, Ach. L. U. 243. Syn. 62. Nyl. Syn. 149. Mudd Man. 259.
FIG :—V. Ak. H. 1816. t. 8. f. 14. Nyl. Syn. t. 5. f. 16.
EXS :—Schær. 10, 11. Rab. 591.
GEOG. DISTRIB :—N. Europe, N. America.
BOT. PROV —5...10...14.
ENGLAND :—Near Ludlow. Shropshire. *Rev. T. Salwey.* Ingleby, Cleveland. *Mr. Mudd.*
SCOTLAND :—Binnie Woods, Haddingtonshire. *Dr. Maingay.*
"Spores .0025—.0045 mm. diam." *(Nyl.)*

Var. *cinereum*, (Pers.) *cinerascenti*-or *albido-granulose*, stipites and capitula *cinereo-suffused.*

On old pines and oaks.

SYN :—*Calicium cinereum*, Pers. Icon. and Descr. Fung. p. 38. Ach. Syn. 57. Nyl. Syn. 149.
FIG :—Pers. Icon. and Descr. Fung. t. 14.
EXS :—Schær. 452.
GEOG. DISTRIB:—Germany, Helvetia, France, Scandinavia, Finland.
BOT. PROV :—20...24.
IRELAND :—Deer Park, Castlemartyr, co. Cork; Tervoe, near Limerick. *Mr Carroll.*

Var. *stemoneum*, Ach. *yellow or flavido-cinerascent, leproso-granulate;* apothecia *black* or *fuscous-black*, capitula *cinereo-pruinose* or nearly *naked* beneath.

On trees.

SYN :—*C. stemoneum*, Ach. L. U. 243. Syn. 62. Nyl. Syn. 150. Mudd Man 260.
FIG :—E. Bot. 2502. Nyl. Syn. t. 5. f. 15.

Exs :—Nyl. 12. M. & N. 956. Schær. 13. 249. Zw. 12. 17. Hepp 158. Rab. 513. Leight. 227. Mudd 248.
Geog. Distrib :—Europe.
Bot. Prov :—2...4...6...10.
England :—Cuckfield, Sussex! *Mr. Borrer.* Bousdale Gill. Newton Wood, and near Ingleby, Cleveland, Yorkshire. *Mr Mudd.* near Bury St. Edmunds, Suffolk. *Rev. G. R. Leathes.*
Wales :—Builth! (on birch).

Var. *ferrugineum*, (Borr.) *pale-cinerascent, conglomerato-granulose* or leprose; apothecia *large, subsessile;* spores *pale-fuscous*, large.

On oaks, pales, &c. 1839.

Syn :—*C. ferrugineum*, T. & B. Lich. Br. 136. Nyl. Syn. 150. Mudd Man. 260.
Fig :—E. Bot. 2473. Nyl. Syn. t. 5. f. 18.
Exs :—Mudd 249. Leight. 315.
Geog. Distrib :—Germany, France.
Bot. Prov :—3, 4, 5...10.
England :—Framlingham, near Norwich. *Mr. D. Turner.* (1839). Moor Park and Hay Park, near Ludlow. *Rev. T. Salwey.* Thorndon Hall Park! *Mr. Piggot.* Little Malvern. co. Worcester. *Mr. Lees.* Hoggarts Wood; Ingleby; Greenhow, Yorkshire! *Mr. Mudd.* Bury St. Edmunds, Suffolk. *Rev. G. R. Leathes.* Ragley Park, Worcestershire. *Mr. Purton.* Wonham, near Reigate. *Mr. W. Joshua.* Shipbourne, Kent. *Mr. Jenner.* Almond Park! near Shrewsbury; Caer Caradoc! Shopshire.
"Spores .004—011 mm. diam." *(Nyl.)*

Var. *brunneolum*, (Ach.) *evanescent;* stipes *slender, elongate*, capitulum *small;* spores sphærical, *minute.*

On old trees, &c.

Syn :—*C. brunneolum.* Ach. in V. A. H. 1816 p. 279. Nyl. Syn. 151. Mudd Man. 260.
Fig :—V. Ak. H. 1816. t. 8. fig. 12. Nyl. Syn. t. 5. f. 16.
Exs :—M. & N. 1068. Schær. 9. Zw. 17. Leight. 252. Mudd 250. Fellm. 12.
Geog. Distrib :—Europe, N. America.
Bot. Prov :—2, 3...10.
England :—Busby Hall; Ingleby Park; Baysdale, Stogdale, Yorkshire! *Mr. Mudd.* New Forest. *Rev. J. M. Crombie.* Redland Woods, Dorking. *Mr. W. Joshua.* Holton Park! near Oxford. *Mr. Larbalestier.*
"Spores .0025—.004 mm. diam." *(Nyl.)*

6. *C. elassosporum*, Nyl. *glaucescent* or *glauco-virescent*, gonidia conglomerate in difformed syngonidia; apothecia black, stipes *robust; spores globulose*, small.

On putrescent alder wood, rare. 1874.

Syn :—Nyl. in Flora 1875. p. 441.
Bot. Prov:—15.
Scotland :—Glen Lochay, Perthshire. *Rev. J. M. Crombie.* (1874).
"Nearly similar to a stronger form of *C. brunneolum*, but with smaller gonidia and spores diam. .0025 mm. or less." (*Nyl.*)

7. *C. melanophœum*, Ach. *whitish, granulose*; stipes *strong, black, naked*, capitula black, *turbinate*, sporal mass umber; spores fuscescent, *globose, moderate.*

On firs, &c., rare.

Syn:—*C. melanophœum*, Ach. in Ak. H. 1816. p. 276. Nyl. Syn. 151. Mudd Man. 259.
Fig :—V. Ak. H. 1816. t. 8. F. 8. Nyl. Syn. t. 5. f. 17.
Exs :—Schær. 638. Zw. 16. Nyl. 11. Anzi It. S. 38. Anzi Ven. 116.
Geog. Distrib :—Scandinavia, Germany, Helvetia, France, N. America.
Bot. Prov :—2, 3...5 ..10, 11...15.
England :—Eglestone. Durham. *Rev. J. Harriman.* Hoggarts Wood and Lounsdale, Cleveland, Yorkshire. *Mr. Mudd.* Sussex! *Mr. Borrer.* Thorndon Hall Park! Essex. *Mr. H. Piggot.* Epping Forest. *Rev. J. M. Crombie.* Oakley Park, near Cirencester. *Mr. W. Joshua.*

SCOTLAND :—Near Stirling and Aberfeldy. *Rev. J. M. Crombie.*
"Spores .0025—.008 mm. diam." *(Nyl).* Spores .009 mm. diam.
*C. trichiale var. ferrugineum* should be compared with this. Are they not both states of the same plant?

8. *C. Kylemoriense*, Larb. *Parasitical* on a whitish thallus, apparently that of *Lecanora cinerea*, (*L.*); *apothecia excessively minute, shortly stipitate; capitulum crateriform, nigro-fuscous, somewhat shining*; *stipes very short, of a paler whitish colour*; paraphyses entangled branched; *spores fuscous or fusco-nigrescent, sphærical*, with a distinct narrow epispore, variable in size.

On shady rocks, rare. 1877.

SYN : —Leight. in Linn. Trans. 2d. ser. 1. 242.
FIG :—Linn. Trans. l. c. t. 33. f. 12. 13. & 14.
BOT. PROV :—26.
IRELAND :—Miderlin! near Kylemore. *Mr. Larbalestier.* (1877).
A very beautiful new species. Spores .006—.008 mm. diam.

B. *Spores* 1-*septate.*

* *Corticolæ.*

9. *C. hyperellum*, Ach. *flavo-virescent, granulose* or *subleprose*; apothecia black, capitulum *globoso-lentiform, stipes black, elongate*, sporal mass black or umber-black; spores nigrescent, ellipsoid, 1-septate, *small.*

On oak, alder, lime, &c. very common. 1783.

SYN :—*C. hyperellum*, Ach. Meth. p. 93. Nyl. Syn. 152. Mudd Man. 258.
FIG :—E. Bot. 1832. Nyl. Syn., t. 5. f. 23.
EXS :—M. & N. 1069 Schær. 241. 242. Leight. 23. Hepp 333. Arn. 105. Mudd 245. Reich. and Schub. 122.
GEOG. DISTRIB :—Europe. Scandinavia. N. America.
BOT. PROV :—3, 4, 5...7, 8...10...15...19...30.
ENGLAND :—Earsham, Norfolk. *Sir J. E. Smith.* near Bury, Suffolk. *Mr. D. Turner.* Kildale and Baysdale. and Brantsdale, Cleveland, Yorkshire. *Mr. Mudd.* Ashe, Norfolk; Ditcheling, and Hurstpierpoint, Sussex! *Mr. Borrer.* Ickworth, Suffolk. *Sir T. Gage.* Pophills, Warwickshire. *Mr. Purton.* Penshurst Park; Chilstone Park, near Lenham; Broome Park, near Siberts-wold, Kent. *Mr. Holmes.* near Cirencester. *Mr. W. Joshua.* Pevensey road, Eastbourne. *Mr. Roper.* Shropshire! Herefordshire! Leicestershire.!
SCOTLAND :—rarely. *Rev. J. M. Crombie.*
IRELAND :—Near Belfast. *Mr. Templeton.* Killarney. *Sir T. Gage.*
WALES :—Near Bala! *Mr. Brittain.* Bettws-y-coed! Builth!
"Spores .002 to .003 in. long, by .001 in. broad." *(Mudd.)* "Spores .009—.016 mm. long, .004—6 mm. broad." (*Nyl.*)

10. *C. trachelinum*, Ach. *cinerascent, thin, granulose* or obsolete, apothecia black, capitulum, *turbinato-globose, rufescent beneath*; spores nigricant, ellipsoid, 1-septate, constricted, *large.*

On trees, pales, &c., not common. 1778.

SYN.—*Calicium trachelinum*, Ach. in V. Ak. H. 1816. p. 272. Nyl. Syn. 154. Mudd Man. 258.
FIG :—E. Bot. 414, Nyl. Syn. t. 5. f. 24.
EXS :—Zw. 15. Hepp 160. Nyl. 16. M. & N. 475. d. Schær. 243. Fellm. 15. Leight. 270. Mudd 246.
GEOG. DISTRIB :—Europe, N. America, Peru.
BOT. PROV :—1, 2, 3, 4, 5...7...10, 11, 12...14, 15...19...22...30, 31.
ENGLAND :—Norfolk. *Sir. W. J. Hooker.* near Bury, Suffolk. *Rev. G. R. Leathes.* Hexham, near Eglestone. *Mr. Winch.* Twineham, Sussex. *Mr. Borrer.* North of England. *Rev. John Harriman.* Sibsbell House. *Dr. G. Johnstone.* near Stokesley, Kildale, Baysdale, Ingleby, Oggeray Hill, Newton Wood, Cleveland, Yorkshire! *Mr. Mudd.* Cumberland. *Mrs. J. Stanger.* Oswestry, Shropshire, *Rev. T. Salwey.* Pophills, Warwickshire. *Mr. Purton.* Wheatfield Park!

Oxfordshire. *Mr. Larbalestier.* Ashton Keynes, near Cirencester. *Mr. W. Joshua.* Bagtor Wood, Ilsington; Holne Chase, Devon. *Messrs. Jones & Kingston.* near Westerham; Wye; Ashover Wood, near Penshurst, Kent. *Mr. Holmes.* Hay Park, near Ludlow! Shropshire.

SCOTLAND:—Rosslyn Woods. *Mr. G. Don.* Braemar. *Rev. J. M. Crombie.*

IRELAND:—Powerscourt. *Dr. Whitley Stokes.* Glenarm. *Dr. Moore.* Castlebernard Park, Bandon. *Mr. J. Sullivan.*

WALES:—Edderton! Montgomeryshire.

CHANNEL ISLANDS:—Noirmont Bay, Jersey. *Mr. Larbalestier.*

"Spores .002 to .0025 in. long, by .001 in. broad." (*Mudd.*) "Spores .008—.013 mm. long, .004—7 mm. broad." (*Nyl.*)

Var. *hemiplodum*, Nyl., stipes rufescent, thickened at the base and upwards gradually into the capitulum, which has a thin whitish margin.

New Forest, near Lyndhurst! *Mr. Larbalestier.* (1873).

11. *C. quercinum*, Pers. *greyish-white, granulose*, or nearly smooth, or subleprose or evanescent; apothecia black, moderate, capitulum *turbinato-lentiform, cinereo-pruinose beneath;* disk *plano-convex, white, pruinose* or naked, with grey margin; spores nigricant, ellipsoid, 1-septate, slightly constricted, *small.*

On oaks, wood, &c. 1805.

SYN:—*C. quercinum*, Pers. Fung. Suppl. 59. Nyl. Syn. 155. Mudd Man. 257.

FIG:—E. Bot. 1465. Nyl. Syn. t. 5, f. 25.

EXS:—Nyl. 14. M. & N. 473, Schær. 247, 505, Zw. 98. Mudd 244.

GEOG. DISTRIB:—Europe, N. America.

BOT. PROV:—1, 2, 3, 4, 5, 6...10..14.

ENGLAND:—Lakenham, Suffolk. *Mr. Borrer.* (1805.) Ayton, Stokesley, Baysdale, Newton Wood, Yorkshire. *Mr. Mudd.* Studley Park, Yorkshire. *Mr. Brunton.* near Thirsk. *Mr. J. G. Baker.* Pembridge, Herefordshire. *Rev. J. F. Crouch.* near Brockenhurst in New Forest. *Rev. J. M. Crombie.* Hexham; Eglestone. *Mr. Winch.* Ugbrook Park; Rora & Perm Woods, Ilsington, Devon. *Messrs. Jones & Kingston.* near Penshurst; Ide Hill, near Sevenoaks; Lympne, Kent. *Mr. Holmes.*

WALES:—Builth!

SCOTLAND:—Auchindenny. *Dr. Greville.*

"Spores .0015 to .0025 in. long, by .001 to .00125 in. broad." (*Mudd.*) "Spores .005—9 mm. long, .003—5. mm. broad." (*Nyl.*)

12. *C. curtum*, Borr. *cinerascent, thin or obsolete;* apothecia *strong*, capitulum *turbinato-cylindrical, margin albo-suffused*, sporal mass *black, protruded;* spores nigricant, ellipsoid, 1-septate.

On wood, pales, &c., common. 1813.

SYN:—*C. curtum*, T. & B. Lich. Br. p. 148, Nyl. Syn. 156. Mudd Man. 257. *C. sphærocephalum var. abietinum*, Ach. Syn. 58.

FIG:—E. Bot. 2503.

EXS:—Zw. 186 & 20. Leight. 133. Hepp 337. Schær. 248. M. and N. 1237. 957. Mudd 243. Fellm. 16. Anzi Langob. 345.

GEOG. DISTRIB:—Europe, Scandinavia, Kamtschatka, N. America, N. Zealand.

BOT. PROV:—1, 2, 3, 4, 5...7..10..15...31.

ENGLAND:—Stokesley, Ayton, Newton, Stogdale, Cleveland! *Mr. Mudd.* Gopsall Park, Leicestershire. *Rev A. Bloxam.* Sussex! *Mr. Borrer.* (1813); Hallow, near Worcester. *Mr. E. Lees.* Batheaston! *Mr. Broome.* Oswestry, Salop! *Rev. T. Salwey.* near Cirencester. *Mr. W. Joshua.* Great Glenham, Suffolk. *Rev E. N. Bloomfield.* Hythe, near Romney; near Otford, Kent. *Mr. Holmes.* Abdon! High Rock, near Bridgnorth! Haughmond Hill! Loppington! Hay Park, near Ludlow! Llanyblodwel rocks! Raglith! near Church Stretton, Shropshire.

SCOTLAND:—Falls of Bruar, Blair Athole. *Rev. J. M. Crombie.*

IRELAND:—Deer Park, Castle Martyr, co. Cork! *Mr. Carroll.*

WALES:—Bala! *Mr. Brittain.* Towyn!

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .0015 to .002 in. long, by .001 in. broad." (*Mr. Mudd.*) "Spores .007—.014 mm. long, .004—7 mm. broad." (*Nyl.*)

13. *C. subtile*, (Pers.) *greyish-white*, *thin*, *filmy ;* apothecia *minute*, stipes *short*, *slender*, black, capitula *minute*, *subglobose* or *turbinato-lentiform*, disk slightly *convex*, brownish-black ; spores fuscescent, oblong, or ellipsoid, 1-septate.

On dead trees, timber, &c., rare. 1812.

SYN :—*C. subtile*, Pers. Fung. Suppl. 60. Mudd Man. 259.
FIG :—E. Bot. 2462.
EXS :—Nyl. 13. Hepp 338. Leight. 314. Mudd 247.
GEOG. DISTRIB :—Europe, Germany, France, Scandinavia, N. America.
BOT. PROV :—2, 3...5...10...14.
ENGLAND :—Blackbeck, Baysdale, Cleveland, Yorkshire ! *Mr. Mudd.* Sussex ! *Mr. Borrer.* (1812). Cawsey Wood, Durham. *Mr. Winch.* Pophills. *Mr. Purton.* New Forest. *Rev. J. M. Crombie.* between Tunbridge Wells Common and Hurst Wood, Kent. *Mr. Holmes.*
SCOTLAND :—Auchindenny Woods. *Dr. Greville.*
"Spores .0015 in. long, by .0005 broad." (*Mudd*). Spores .006—.009 mm. long, .003 mm. broad.

14. *C. populneum*, (De Brond.) *macular*, pale or whitish ; apothecia *entirely black*, slight, somewhat shining, stipes slender, capitulum *turbinate ;* spores nigrescent, ellipsoid, *simple*, *large*, 1-septate.

On poplars, rare. 1813.

SYN :—*C. populneum*, *De Brondeau* in Dub. B. Gall. 638. Nyl. Syn. 159.
EXS :—Hepp 339. Zw. 287. Arn. 60. Anzi Langob. 424.
GEOG. DISTRIB :—W. France.
BOT. PROV :—19.
IRELAND :—Killarney. *Sir T. Gage.* (1813).

15. *C. retinens*, Nyl. *white*, opake, thin, *subfarinaceous*, effuse ; apothecia *black*, minute, *sessile*, *lecideiform*, sporal mass indistinct ; spores nigrescent, oblong, or oblongo-cylindrical, conspicuously 1-*septate ;* hypothecium rubricoso-fuscescent.

On oak. 1868.

SYN :—*C. retinens*, Nyl. in Flora 1868, p. 161.
BOT. PROV :—31.
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.* (1868).
"Spores .008—.011 mm. long, .0025—.0035 mm. broad. (*Nyl.*)

** *Saxicolæ.*

16. *C. citrinum*, (Leight.) parasitic on thallus of *Lecidea lucida ;* stipes short and stout or elongated, *rusty-brown*, *flavo-pulverulent*, capitulum *globose*, sporal mass yellowish-brown ; spores *minute*, linear-oblong, *simple*, or *uniseptate*, fuscescent.

On the under surface of stones in walls. 1856.

SYN:—*Coniocybe citrina*, Leight. Ann. & Mag. N. H. 1857. p. 130. Nyl. Syn. 149. Mudd Man. 261.
FIG :—Ann. and Mag. N. Hist. t. 8. f. 9. Nyl. Syn. t. 7. f. 1.
EXS :—Leight. 269. Zw. 286. Rab. 787.
GEOG. DISTRIB :—Saxony.
BOT. PROV :—7...10...12 . 15.
WALES :—Between Corwen and Bala ! (1856). Tygwyn ! near Dolgelley. South base of Moel-y-gest ! near Tremadoc.
ENGLAND :—Stavely, near Kendal. Westmoreland, and Dent, Yorkshire. *Mr. Martindale.*
SCOTLAND :—Glen Fender, Blair Athole, *Rev. J. M. Crombie.*

"Spores .0015 to .002 in. long. by .0005 in. broad." (*Mudd.*) "Spores .006—.011 mm. long. .0025—35 mm. broad." *(Nyl.)* Spores .008 mm. long. .003 mm. broad.

C. *Spores 3-septate,*

17. *C. septatum,* (Leight.) obsolete; apothecia *brownish-black,* stipes *short, stout and smooth,* capitulum *clavato-pyriform,* truncate, incurved at the margin; disk *depressed,* dark brown; spores 8, *very large, elliptical, 3-septate, umber-coloured,* cells granular.

Parasitic on thallus of *Thelotrema lepadinum* and on holly. 1856.

SYN:—*Sphinctrina septata,* Leight. in Ann. and Mag. N. Hist. 1857. p. 132. *C. cusporum,* Nyl. Syn. 160. Mudd Man. 256. *C. trajectum,* Nyl.
FIG:—Ann. and Mag. N. Hist. 1857. t. 8. f. 20. 24. Nyl. Syn. t. 5. f. 28.
EXS:—Zw. 21. Leight. 228. Arn. 152. Mudd 242. Anzi Ital. S. 47. Rabh. 757.
GEOG. DISTRIB:—Bavaria, France.
BOT. PROV:—2...10...19...36.
ENGLAND:—Ingleby Park, Brantsdale, Farndale, Bousgale Gill, Hoggarts Wood, Cleveland, Yorkshire! *Mr. Mudd.* (1859). New Forest, *Rev. J. M. Crombie.*
IRELAND:—Near Killarney and Old Deer Park, Castlemartyr, co. Cork; Glenbower, Killeagh. *Mr. Carroll.* Lough Inagh! Galway. *Mr. Larbalestier.*
"Spores .008 to .012 in. long, by. 00325 to .004 in. broad." (*Mudd.*) "Spores .018—36 mm. long, .007—.011 mm. broad." *(Nyl.)* Spores .044—.052 mm. long, .018 - .019 mm. broad.
All the authentic specimens of *C. trajectum,* Nyl. which I have received from Mr. Crombie and Mr. Larbalastier, are precisely identical with my *C. septatum.*

18. *C. byssaceum,* Fr. obsolete; apothecia *minute, slender,* dispersed; *spores nigrescent, oblongo-fusiform,* simple or ultimately 1—3-septate.

On dead alder twigs and sloe, rare.

SYN:—Fr. L. E. 309. Nyl. Syn. 160. Crombie in Journ. Bot. n. s. 2.133.
FIG:—Nyl. Syn. t. 5. f. 27.
EXS:—Fellm. 19. Fries Scand. 48. Anzi Langob. 264.
GEOG. DISTRIB:—Scandinavia, East Lapland, Sweden, Lombardy, Bavaria.
BOT. PROV:—5...7...15.
ENGLAND:—Hay Park, Herefordshire!
SCOTLAND:—Banks of the Garry, Blair Athole. *Rev. J. M. Crombie.* (1873).
WALES:—Tan-y-bwlch Wood, Capel Curig! *Mr. W. Phillips.* Dolgelley!
"Spores .015—23 mm. long, .005—7 mm. broad." (*Nyl.*)

## III. CONIOCYBE. *Ach. Nyl.*

Thallus leprose or powdery, effuse or evanescent. Apothecia yellow or pale (not black), stipitate, excipulum very open. Spores sphærical, colourless or flavescent, forming the globoso-pulverulent capitulum.

1. *C. furfuracea,* Ach. *sulphureous or sulphureo-virescent, apothecia sulphureo-suffused,* or with flavovirescent, naked, *elongate stipites,* sporal mass *yellow or pale umber;* spores colourless or pale fuscescent, sphærical, *minute.*

On roots of trees and sandy ground, not common. 1805.

SYN:—*C. furfuracea,* Ach. in V. Ak. H. 1816, p. 288. Mudd Man. 262. Nyl. Syn. 161.
FIG:—E. Bot. 1539. Ann. & Mag. N. H. 1857, t. 8, f. 14. Nyl. Syn. t. 5, f. 37.
EXS:—Schær. 14. M. &. N. 1238. Leight. 225. Anzi Ital. S. 35, Hepp 758.
GEOG. DISTRIB:—Europe, Switzerland, Italy, Germany, Lapland, N. America.

BOT. PROV :—2, 3, 4, 5...7...10, 11, 12...14, 15...30.

ENGLAND :—Near Bury, Suffolk. *Rev. G. R. Leathes.* (1805). Dorking and Esher, Surrey; near Halesworth, Suffolk; Shanklin, Isle of Wight; Henfield, Sussex! *Mr. Borrer.* Cumberland! *Mrs. Stanger.* Red Wood, Cotteswold, near Cheltenham. *Mr. Lees.* Oswestry; Ludlow, Shropshire. *Rev. T. Salwey.* Brantsdale, Yorkshire. *Mr. Mudd.* near Gatehead, Durham. *Mr. Robertson.* Bartley Lodge, New Forest. *Mr. Lyell.* Cow Close, near Ravensworth, and Long Acre Wood, Durham; Felton Wood; Wansbeck; Wallington; Northumberland. *Mr. Winch.* near Stourbridge, Worcestershire. *Mr. Scott.* Blackwater! Hants. *Mr. Joshua.* Chiselhurst, Kent. *Mr. Howze.* Huglith! near Church Stretton; High Rock! near Bridgnorth; near Berrington! and Boreton! Broomhall! near Oswestry; Grinshill! Shropshire.

SCOTLAND :—Edinburgh. *Dr Maingay.* Cramb's Wood, near Glammis, Forfarshire. *Mr. W. Gardiner.* Aberfeldy, Blair Athole. *Rev. J. M. Crombie.* Largo! Fifeshire. *Rev. C. Howie.*

IRELAND :—Near Belfast. *Mr. Templeton.*

WALES :—Edderton! Montgomeryshire; Betwys-y Coed!

"Spores .00075 in. diam." (*Mudd.*) "Spores .0025—.003 mm. diam." (*Nyl.*) Spores .002—.003 mm. diam.

Var. *sulphurella*, Fr. *cinerascent*, very thin, or obsolete; apothecia *very slender.*

On old trees, very rare. 1869.

SYN :—Fries L. E. p. 382. (1831); Nyl. Scand. 44. Syn. 162. Mudd Man. 262.

FIG :—Hepp Sporen t. 18. f. 154.

EXS :—Schær. 639. Hepp 154. Nyl. 7. Arn. 318. Korb. 292.

GEOG. DISTRIB :—Europe, Sweden, Switzerland, France, Bavaria, Germany.

BOT. PROV :—2.

ENGLAND :—New Forest, Hants. *Rev. J. M. Crombie.* (1869).

Var. *fulva*, (L.) *greenish yellow, apothecia* more compact and *with shorter stipites.*

On dead stems of *Rosa canina*, rare. 1870.

SYN :—Fr. L. E. 382. Nyl. Syn. 162. Mudd Man. 262. *Mucor fulvus*, Linn. Sp. 1655. *Cal. aciculare*, Ach.

FIG : —Wahlnb. in V. A. H. 1806. t. 4. f. 7.

EXS :—Schær. 296.

SCOTLAND :—Base of Craig Tulloch. *Rev. J. M. Crombie.* (1870).

2. *C. pallida*, Fr. *albicant*, very thin, or obsolete; *apothecia* small, *stipes hyaline* or pale yellow, rarely fuscescent upwards, capitulum globose, sporal mass *white or pallescent;* spores colourless, sphærical, *large.*

On trees, rare. 1805.

SYN :—*C. pallida*, Fr. Sched. Crit. 1, p. 3. Nyl. Syn. 163. Mudd Man. 262.

FIG :—E. Bot. 2557. Ann. & Mag. N.H. 1857, t. 8, f. 16. Nyl. Syn. t. 5, f. 38.

EXS :—Schær. 7. Zw. 101, 102. Tuck. 146. Hepp 44, 155. Reich. & Schub. 146. Smrft. 54.

GEOG. DISTRIB :—Sweden, Switzerland, Germany, Pyrenees, N. America.

BOT. PROV :—3...9...11.

ENGLAND :—Near Eglestone, Durham; East Common Wood, near Hexham and Felton. *Mr. Winch.* (1805.) Teesdale, Durham. *Rev. J. Harriman.* Clougha, Lancashire. *Mr. R. Jacob.* Oxford. *Mr. Baxter.*

"Spores .00125 in. diam." (*Mudd.*) "Spores .004—9 mm. diam." (*Nyl.*) Spores .008 mm. diam.

3. *C. hyalinella*, Nyl. nearly obsolete; apothecia with a *slender hyaline* stipes, sporal mass globose, *white or pallido-rufescent;* spores colourless, sphærical, *very minute.*

On old wood, rare. 1865.

SYN :—Nyl. Prodr. 33. (1861); Syn. 164. Crombie En. 14.

FIG :—Nyl. Syn. t. 5. f. 40.

Exs :—M. & N. 1162. Arn. 317.
Geog. Distrib :—Switzerland, Sweden.
Bot. Prov :—10.
England :—Brantsdale, Yorkshire. *Mr. Mudd.* (1865)
"Spores .0025—.004 mm. diam." (*Nyl.*) Spores .003— 004 mm. diam.

## IV. TRACHYLIA. *Fr. pr. p. Nyl.*

Thallus thin, granulose, or subleprose, or foreign. Apothecia black, sessile, cupuliform, open, sporal mass black. Spores nigricant or fuscous-black, ellipsoid or oblong, 1-septate, rarely pluriseptate. Spermatia oblong or ellipsoid.

1. *T. tigillaris*, Fr. *flavo-virescent or citrine*, granulose or granuloso-areolate; *apothecia black, innate* or slightly prominent; spores fusco-nigricant, oblong or ellipsoid, 1-septate. (K—)

On old posts, pales, &c., rare. 1805.

Syn :—*T. tigillaris*, Fr. Scand. p. 282. Nyl. Syn. 165. Mudd Man. 254.
Fig :—E. Bot. t. 1530. Nyl. Syn. t. 5. f. 29.
Exs :—M. & N. 1067. Schær. 451. Hepp 159. Rab. 214. Zw. 284. Anzi It. S. 44. Mudd 240. Smrft. 139. Reich. & Schub. 56.
Geog. Distrib :—Scandinavia, Germany, Switzerland, Italy.
Bot. Prov :—3, 4.
England :—Enfield Chase, *Mr. Dickson*. (1805). Walthamstow, Loughton, Essex. *Mr. E Forster*. Southtown, near Yarmouth, *Mr. D. Turner*. Herringfleet, Suffolk. *Rev G. R. Leathes*. Colchester. *Rev. J. M. Crombie*. Felixtow, Suffolk. *Mr. Larbalestier*.
"Spores .003 to .0035 in. long, by .00175 to .002 in broad," (*Mudd*). "Spores .015—25 mm. long, .008—.011 mm. broad, spermatia ellipsoid. "(*Nyl.*)

2. *T. tympanella*, Fr. *albicant or cinerascent*, granulose or granuloso-concrescent; apothecia black, *prominent, margin of excipulum cinereo*-or *albo-suffused*, sporal mass black, slightly *cinereo-pruinose;* spores fuscous, oblong, 1-septate. (K +)

On posts, palings, &c., very common. 1800.

Syn :—*T. tympanella*, Fr. Scand. 282. Nyl. Syn. 166. Mudd Man. 254.
Fig :—E. Bot. 810. Nyl. Syn. t 5. f 32.
Exs :—M. & N. 859. Schær. 438. Hepp 330. 331. Anzi It. S. 45. Langob. 211. Leight. 88 Mudd 240.
Geog. Distrib :—Scandinavia, Switzerland, Italy, Algeria.
Bot. Prov :—2, 3, 4, 5...10...31.
England :—Yarmouth. *Mr. D. Turner*. (1800). Parton, Gloucestershire. *Mr. W. Joshua*. Penshurst; Brasted; near Egerton; Dunk's Green, near Hadlow, Kent. *Mr. Holmes*. Essex. *Mr. Sowerby*. Ayton, Rosedale, Yorkshire! *Mr. Mudd*. Oswestry, Shropshire. *Rev. T. Salwey*. Epping Forest. *Rev. J. M. Crombie*. Exminster Marshes, Devon. *Mr. Parfitt*. Haughmond Hill! Wrekin! Sutton! near Shrewsbury! Aymestrey! Herefordshire.
Ireland :—Curraghmore, near Waterford. *Adm. Jones*.
Channel Islands :- Jersey. *Mr. Larbalestier*.
"Spores .003 to .0035 in. long, by .0015 to .00175 in broad." (*Mudd*). "Spores .010—18 mm. long, .007—.012 mm. broad." (*Nyl.*)

3. *T. stigonella*, Fr. *parasitic* on *Pertusariæ;* apothecia *scarcely prominent*, entirely black, *plane;* spores fusco-nigricant, ellipsoid, 1-septate, obtusely rotundate at the apices.

On old oaks.

In *T. stigonella*, the reaction K is at first bright yellow, then changing to sanguineous.
Syn:—*T. stigonella*, Fr. Scand. p. 282, Nyl. Syn. 167. Mudd Man. 254.
Fig :—Nyl. Syn. t. 5. f. 33.
Exs :—M. & N. 858. Hepp 332. Schær. 502. Nyl. 17. Zw. 209. Leight. 226. Arn. 905. Crombie 11.

GEOG. DISTRIB :—France, Germany, Switzerland, Bavaria.

BOT. PROV :—2, 3 ..5...7 10...11.

ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.* Easby Wood, and near Ingleby, Yorkshire. *Mr. Mudd.* Sussex ! *Mr. Borrer.* Essex ! *Mr. H. Pigott.* Llanforda and Middleton Lane, near Oswestry, Shropshire ! *Rev. T. Salwey.* Oakwood and Dilston Park, Northumberland. *Mr. Winch.* near Lyndhurst and Brockenhurst, New Forest. *Rev J. M. Crombie.* Oakley Park, near Cirencester ! *Mr. W. Joshua.* Haughmond Hill ! Shropshire.

WALES :—Barmouth. *Rev. T. Salwey.*

"Spores .0025 to .003 in. long, by .0015 broad." (*Mudd.*) "Spores .009—.017 mm. long, .007- .010 mm. broad." (*Nyl.*) Spores 016—.018 mm. long, .007—.009 mm. broad.

## TRIBE II. SPHÆROPHOREI.

Thallus fruticulose, ramose and ramulose, the apices subgloboso-incrassate enclosing the apothecia ; apothecia nucleiform, enclosed, ultimately exposed by the dehiscence of the thalline covering; sporal mass black.

### I. SPHÆROPHORON. *Pers.*

Thallus cæspitoso-fruticulose, smooth, polished, fragile ; apothecia seated on the apices of the thallus, receptacle irregularly and variously dehiscent. Spores nigricant or violaceo-nigricant, sphærical or subglobose, covered with a black powder. Spermatia oblong.

1. *S. compressum*, Ach. *pallido-albicant*, ramose, *plano-compressed;* apothecia *obliquely innate* on the apices, receptacle lacero-dehiscent or *discoid* and open ; spores *nigricant*, sphærical. (K—)

On rocks, rare. 1799.

SYN :—*S. compressum*, Ach. Meth. p. 135. Nyl. Syn. 170. Mudd Man. 264.

FIG : E. Bot 114 Leight. Ang. Lich. t. l. f. 3.

EXS :—Rab. 43. Mudd 254. Anzi Langob. 422. Reich. & Schub. 43.

GEOG. DISTRIB :—France, Switzerland, Germany, N. & S. America, Australasia, Ceylon.

BOT. PROV :—1, 2...5...7, 8 10, 11 14, 15...26...31.

ENGLAND :—Tunbridge. *Mr. E. Forster.* Cromford Moor, near Matlock. *Sir J E. Smith.* Sussex ! *Mr. Borrer.* Falcon Clints, Teesdale. *Mr. Baker.* High Green Wood, Heptonstall, Yorkshire. *Dr Carrington.* Farndale and Hobhole, Yorkshire ! *Mr. Mudd.* Kielder, Northumberland. *Prof. Balfour.* Craigforda and Mynydd-y-Myfyr, near Oswestry, Shropshire. *Rev. T. Salwey.* Eglestone ; Kintsley ; Muggleswick ; Durham ; Shaftoe Crags ; Harbottle Moor ; Gunnerston Crags ; Cheviot ; Hedgehope ; Simonside ; Northumberland. *Mr. Winch.* Malvern Hills, Worcestershire ; Sugar-loaf, Monmouthshire. *Mr. Purton.* Ardingley rocks, Sussex *Mr. W. Joshua.* Dartmoor Tors. *Messrs Jones and Kingston.*

SCOTLAND :—Dunearn, near Edinburgh. *Dr. Greville.* Clova mountains, *Mr. G. Don.* Killin and Lochaber *Rev. J. M. Crombie.*

IRELAND :—Connemara, *Dr. Moore.* Kerry. *Dr. Taylor.* Killarney *Mr. Carroll.* Dawross River ! Diamond Mountain ! co. Galway *Mr. Larbalestier.*

WALES :—Cwm Bychan, near Barmouth. *Rev. T. Salwey.* Aberdovey. *Rev. A. Bloxam.*

CHANNEL ISLANDS :—Guernsey *Rev. T. Salwey.*

"Spores .0015 to 00175 in diam." (*Mudd*) "Spores .007—.011 mm diam." (*Nyl.*) Spores .006—.007 mm. diam.

2. *S. coralloides*, Pers. pale or whitish or *reddish-brown*, minutely and *copiously branched*, *round*, shining ; apothecia black, *terminal*, *globose*, receptacle *irregularly dehiscent* above, persistent ; spores *violacio-nigricant*, sphærical. (K—) I medulla *blue*.

On rocks, common. 1794.

SYN :—*S. coralloides*, Pers. in Ust. N. Ann. 1. p. 23. Nyl. Syn. 171. Mudd Man. 263.

FIG :—E. Bot. 115. Leight. Ang. Lich. t. 1 f. 1.

EXS :—Schær 453 Hepp 217. M. & N. 262. Mudd 253. Anzi. Langob. 421. Welw. 49. Tuck. 50.

GEOG. DISTRIB :—Europe Madeira, Antarctic America, Australasia.

BOT. PROV :—1, 2, 3...5...7, 8...10, 11...14...16...18, 19.

ENGLAND :—Sussex ! *Mr. Borrer* Bilsdale, Yorkshire. *Mr. Teesdale.* (1794). Mynydd-y-Myfyr and Craigforda ! Shropshire. *Rev. T. Salwey.* Yorkshire ! *Mr. Mudd.* Derbyshire. *Mr Bohler.* Cromford Moor, near Matlock. *Sir J. E. Smith.* Murton Craigs Penmanshiel. *Dr. G. Johnston.* near Castle Karn Bre, Cornwall. *Messrs Turner & Sowerby.* Part's Crags; Stockdale Gill; Giggles-wick Farm; near Park, beyond Ingleton, Yorkshire, *Dr. Windsor.* Teesdale; Weardale; Durham. Cheviot; Simonside; Hedgehope; House-steads; Cunnerton Crags; near Harbottle and Heddon-on-the-wall, Northumberland. *Mr. Winch.* Malvern Hills, Worcestershire; Sugar-loaf, Monmouthshire. *Mr. Purton.* Hungershall Rocks, Kent. *Mr. Holmes.* Ardingley Rocks, Sussex. *Mr. W. Joshua.* Devon. *Messrs. Jones & Kingston.* Stiperstones ! Caer Caradoc !

SCOTLAND :—Pentland Hills. *Dr. Greville.* Highlands and Lowlands. *Sir. W. J. Hooker.* Long Island; Arran; Hebrides. *Prof. Balfour.* Garrynahine. *Dr. Lindsay.*

IRELAND :—Bantry. *Miss Hutchins.* Lough Bray. *Adm. Jones.* Killarney. *Dr. Carrington.*

WALES :—Cwm Bychan. *Rev. T. Salwey.* Barmouth! *Mr. Lees.* Holyhead Mountain ! Capel Curig ! Aran Mowddy ! Cwm Cywion !

CHANNEL ISLANDS :—Jersey, Guernsey, Alderney and Sark. *Mr. Larbalestier.*

"Spores .00175 in. long, by .001 to .0015 in. broad." (*Mudd.*) "Spores .009—.015 mm. diam." (*Nyl.*) Spores .009—.011 mm. diam.

3. *S. fragile*, Pers. *whitish*, lurido-cinerascent or brownish, *round, sparingly branched, densely cæspitose ;* apothecia black, *terminal, globose*, receptacle irregularly dehiscent above, persistent ; spores *violaceo-nigricant, sphærical or globoso-ellipsoid.* (K +) *medulla I—.*

On rocks, common.

SYN :—*S. fragile*, Pers. in Ust. N. Ann. 1. f. 23. Nyl. Syn. 172. Mudd Man. 264.

FIG :—E. Bot. 2474. Leight. Ang. Lich. t. 1. f. 2.

EXS :—M. & N. 263. Anzi It. S 34. Fellm. 21. Hepp 664. Schær. 15.

GEOG. DISTRIB :—Europe, Arctic Europe, Antarctic America.

BOT. PROV:—1, 2...5...8.. 10...14, 15...18, 19...29.

ENGLAND :—St. Cleere, near Liskeard. *Messrs. Turner & Sowerby.* Charnwood Forest, Leicestershire ! *Rev A Bloxam.* Craigforda, near Oswestry ! *Rev. T. Salwey.* Yorkshire. *Mr. Mudd.* Harrogate, Yorkshire. *Mr. Teesdale* Cheviot; Hedgehope; Simonside; Harbottle; Northumberland. Weardale and Teesdale, Durham. *Mr. Winch.* Ardingley rocks, Sussex. *Mr. W. Joshua.* Sheeps Tor and other Tors on Dartmoor. *Messrs. Jones & Kingston.* Stiperstones Hill ! Shropshire.

SCOTLAND :—Pentland Hills ! *Dr. Greville.* Hebrides. *Prof. Balfour.* Braemar. *Rev. J. M. Crombie.*

IRELAND :—Malin Head, co. Donegal. *Dr. Dickie.* Killarney. *Dr. Carrington.*

"Spores .007—.016 mm. diam." (*Nyl.*) Spores .007—.013 mm. diam.

## SERIES II. CLADODEI.

Thallus generally erect ; apothecia terminal on podetia (rarely without), biatorine, rarely lecanorine ; spores 8, colourless, generally oblong and simple, sometimes elongate and septate ; paraphyses distinct.

## TRIBE. III. BÆOMYCEI.

Thallus horizontally expanded, crustaceous. Apothecia pale or rufescent, sessile or podetiiformi-stipitate ; spores simple or septate.

## I. GOMPHILLUS. *Nyl.*

Thallus very thin, consisting of sphærical gonidia and irregular filaments conglutinated. Apothecia stipitate, small, corneous. Spores 8, filiform, multiseptate. Paraphyses indistinct. Sterigmata simple. Spermatia slender, cylindrical, straight.

1. *G. calycioides*, Nyl. cinerascent or cinereo-virescent, thin, effuse or obsolete; apothecia small, stipitate, capitulum subturbinate, nigricant; spores very long, cylindrical, 60-100-septate.

On mosses, &c., rare.

SYN :—*G. calycioides*, Nyl. Prodr. p. 146. Syn. 175.
FIG :—Nyl. Syn. t. 7. f. 3.
EXS :—Rab. 736. Mass. 85. Anzi Langob. 17.
GEOG. DISTRIB :— France, Italy.
BOT. PROV :—7...19...26.
IRELAND :—Carig Mountain, co. Kerry. *Dr. Taylor.* Turk Mountain, Killarney. *Mr Carroll.* Letter Hill! 5 miles from Kylemore. *Mr. Larbalestier.*
The Irish plant is the var. *microcephala*, Nyl. Syn. 175. "minor, apotheciis minoribus parum stipitatis."
WALES :—Dolgelley! *Mr. W. Phillips.*
"Spores 160—200 mm. long." (*Nyl.*)

## II. BÆOMYCES. *Pers.*

Thallus crustaceous, pulvereous, granulose or squamulose. Apothecia biatorine, sessile or stipitate. Sterigmata articulate. Spermatia cylindrical, straight.

1. *B. rufus*, DC. *albo-virescent or albido-glaucescent*, thin, effuse, *minutely granulose or squamulose or leprose*, granules depressed (K. yellow); apothecia *carneo-rufescent or carneo-fuscescent*, somewhat convex, immarginate, stipes moderate or very short, whitish; spores 6 or 8, *oblongo-ellipsoid*, simple, colourless.

On earth and stones, not uncommon.

SYN :—*B. rufus*, DC. Fl. Fr. 2. p. 342, Nyl. Syn. 176. Mudd Man. 63.
FIG :—E. Bot. 373 Nyl. Syn. t. 1. f. 12. t. 6. f. 12. 13. 14.
EXS :—Tuck. 41. Anzi It. S. 32. 33. Fellm. 22. Nyl. 27. M. & N. 70. Schær. 32. Mudd 30. Larb. 6. Leight. 178. Stenh. 135.
GEOG. DISTRIB :—Europe, America, N. Zealand.
BOT. PROV :—1, 2, 3, 4, 5...7...10, 11...13, 14, 15...20.. 26...31.
ENGLAND :—Epping Forest and Hornsey Wood. *Sir J. E. Smith.* Berwick-on-Tweed. *Dr. G. Johnston.* Whitsuncliffe! Yorkshire. *Mr. Baker.* near Ayton! Cleveland. *Mr. Mudd.* Dartmoor and Lustleigh Cleeve, Devon. *Mr. Parfitt.* Ampthill, Beds. *Rev. C. Abbot.* Scotswood; Heaton Denes; Caervoran; Twizell Dene, Northumberland. *Mr. Winch.* Shotover Hill, Oxford. *Mr. Baxter.* Tiptree Heath, Warley, Essex. *Mr. Varenne.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Rowlands Gill, Durham. *Rev. W. Johnson.* Brasted; Ightham Common; Rusthall Common, Kent. *Mr. Holmes.* Brampton Brian Park! Herefordshire. Stiperstones! Haughmond Hill! Whitecliffe Woods, near Ludlow! between Hopton and Great Ness! Long Mynd! Shropshire.
SCOTLAND :—Glasgow. *Sir J. E. Smith.* Rosslyn and Auchindenny Woods; Brand Hermitage, near Edinburgh. *Dr. Greville.* Baldovan; Sidlaw Hills. *Mr. W. Gardiner.* Den of Balthayock, Perthshire! *Dr. Ogilvie.* Kinfauns, Perth! *Dr. Lindsay.* Glen Girnac. *Rev. J. M. Crombie.*
IRELAND :—Doughruagh Mountain! Tully! co. Galway. *Mr. Larbalestier.*
WALES :—Barmouth! Builth!
CHANNEL ISLANDS :—Rozel Manor, Jersey. *Mr. Larbalestier*, Guernsey. *Rev. T. Salwey.*
When hydrate of potash is applied, the thallus becomes yellow (K+) but it has no effect on the apothecia (K—). The thallus when growing on stones is

minutely depresso-granular, but when growing on the earth the granules become squamulose, and it then constitutes the variety *carneus*, Flk. D.L. 8, which occurs in the Channel Islands, and at Glengariff, Ireland. see Larb. 7.

"Spores .001 to .00125 in. long, by .0005 in. broad." (*Mudd.*) "Spores .006—12 mm. long, ·003—4 mm. broad." (*Nyl.*) "Spores .007—12 mm. long, .0025—.004 mm. broad." (*T M. Fr.*)

Forma *sessilis*, Nyl. *apothecia* small, cinerascenti-carneous, *sessile*.

On rocks, rare, 1876.

SYN :—Nyl. Syn. p. 177 (1858) *B. rupestris*, Pers. in Ust. Ann. 1. p. 19.
EXS :—Fellm. 23 Anzi Langob. 423.
GEOG. DISTRIB :—E. Lapland. Lombardy.
BOT. PROV :—26.
IRELAND :—Galway Road! *Mr. Larbalestier*. (1876).

2. *B. roseus*, Pers. *whitish*, granuloso-crustaceous, (K faint yellow); *apothecia roseo-carneous or albo-carneous*, subglobose, stipitate, (K orange); stipes white, roundish, short; spores 6 or 8, *fusiformi-oblong or fusiform*, simple or obsoletely 1-septate; iod. faint blue.

On the earth, rare.

SYN :—Pers. in Ust. N. Ann. 1. p. 19. Nyl. Syn. 179. Mudd Man. 63.
FIG :—E. Bot. 374. Nyl. Syn. t. 6. f. 15. 16. 17. 18. 19. 20. 21.
EXS :—Nyl. 26. M. & N. 71. Anzi It. S. 31. Mudd 31. Schær. 31. Hepp 119. Mass. 82. Tuck. 40. Leight. 355. Smrf. 156, Reich. and Schub. 16.
GEOG DISTRIB :—Europe, America, N. Zealand.
BOT. PROV :—1...3, 4, 5...7...10, 11...14, 15...19...25, 26.
ENGLAND :—Kielder, Northumberland. *Prof. Balfour*. Carlton Beck! and Lounsdale! Cleveland. *Mr. Mudd*. near Exeter. *Mr. Parfitt*. Ampthill, Beds. *Rev. C. Abbot*. Bovey Heathfield Devon. *Messrs. Jones & Kingston*. Top of West Allen Carrs, Northumberland. *Rev. W. Johnson*. Ightham Common; Toy Hill, Kent. *Mr. Holmes*. Wapley Hill! Herefordshire.
SCOTLAND :—Pentland Hills. *Dr. Greville*. Baldovan, Sidlaw Hills and Clova. *Mr. W. Gardiner*. Blaeberry Hill! Perth. *Dr. Lindsay*.
IRELAND :—Near Clonmel! *Mr. Wright*. Connemara. *Dr. Moore*. Killarney. *Dr. Carrington*.
WALES :—Valley above Borthwnog; Hendreforion and near Barmouth. *Rev. T Salwey*. Montgomeryshire. *Sir J. E Smith*. Crib Coch! Snowdon.

"Spores .004 to .006 in. long, by .005 in. broad." (*Mudd.*) "Spores .011—26 mm. long, .0025—.003 mm. broad." (*Nyl.*) "Spores .011—26 mm. long, .002—3 mm. broad." (*T. M. Fr.*) Spores .017—.021 mm. long, .003 mm. broad.

3. *B. placophyllus*, Ach. *whitish or glaucescent*, crustaceo-imbricate, adnate, *corrugate or squamoso-lobate, plicate and sub-crenulate*, (K yellow); apothecia *carneo-rufescent or carneo-fuscescent*, stipitate, (K—) stipes apically divided, and bearing several aggregate and confluent apothecia; spores *oblongo-ellipsoid*, simple.

On the earth, very rare.

SYN :—*B. placophyllus*, Ach. Meth. p. 322. Nyl. Syn. 180. Mudd Man. 63.
FIG :—Ach. Meth. t. 7. f. 4.
EXS :—Tuck. 42. Arn. 448.
GEOG DISTRIB :—N. Europe, N. America.
BOT. PROV :—5...7...11, 12...15
ENGLAND : — Cumberland! *Mrs. Stanger*. Eglestone, Durham. *Rev. J. Harriman*. Swinnop, East Allendale, Northumberland. *Rev. W. Johnson*. Longmynd! Shropshire.
SCOTLAND :—Sidlaw Hills. *Mr. W. Gardiner*. Foot of Ben Lawers. *Adm. Jones*. Grampians; Braemar; Morrone. *Rev. J. M. Crombie*.
WALES :—At foot of Cader Idris. *Mr. Ralfs*. Arran Fowddy. *Mr. Borrer*. rocks behind Union Workhouse, Corwen; Barmouth. *Rev. T. Salwey*. Cwm Cywion!

"Spores .0025 in. long, by .0005 in. broad." *(Mudd.)* "Spores .010—15 mm. long. .0035—.004 mm. broad." (*Nyl.*) "Spores .010—15 mm. long. .002—4 mm. broad." (*T. M. Fr.*)

4. *B icmadophilus*, (Ehrh.) *glaucescent or whitish*, granulato-rugose or subleprose, moderate, (K yellow); apothecia *pale flesh-coloured, discoid, biatorine*, plane, or sub-lecanorine, (K brown); spores 6 or 8, *fusiform, 1-3 septate*; iod. pale blue.

On the earth, not common.

SYN:—*L. icmadophilus*, Ehrh. Phytogr. No. 40. Nyl. Syn. 183. Mudd Man. 64.
FIG:—E. Bot. 372. Nyl. Syn. t. 6. f. 7, 8, 9, 10, 11. & t. 7. f. 2.
EXS:—M. & N. 173. Tuck. 43. Mass. 5. Anzi It. S. 224. Hepp 137. Mudd 32. Fellm. 24. Schær. 46. Reich. & Schub. 27. Leight. 209.
GEOG. DISTRIB:—Europe, N. America, E. Indies.
BOT. PROV:—2...4...8...10...26.
ENGLAND:—Matlock. *Sir J. E. Smith.* Yorkshire! *Mr. Dixon.* Guisboro' Moor! and Oggeray Gill! Cleveland. *Mr. Mudd.* Bedfordshire. *Rev. C. Abbott.* Houghton Moor, Yorkshire. *Mr. Teesdale.* Moughton, near Settle. *Dr. Windsor.* Ardingley, Sussex. *Mr. Larbalastier.*
SCOTLAND:—Long Island. *Prof. Balfour.* Den of Balthayock, Perthshire! *Dr. Ogilvie.* Grampians. *Rev. J. M. Crombie.* Ben Lawers; Ben More; Crainlarich. *Dr. Holl.*
IRELAND:—Pass of Keim-an-Eigh-Wist, co. Cork! *Mr. Carroll.* Salrock! Kylemore! Connemara. *Mr. Larbalastier.*
WALES:—Cwm Bychan! *Rev. T. Salwey.* near Dolgelley!
"Spores .0035 to .0045 in. long, by .001 in. broad." *(Mudd.)* "Spores .013—27 mm. long, .004—6 mm. broad." (*Nyl.*) "Spores .013—27 mm. long, .004—6 mm. broad." (*T. M. Fr.*) Spores .033 mm. long. .008 mm. broad.

## TRIBE IV. CLADONIEI.

Thallus partly or entirely laciniato-foliolose, or squamoso-foliolose, or fruticulose or cæspitose, with fistulose podetia, often ramose. Apothecia biatorine, or cephalodine, convex, immarginate, on the podetia, rarely on the leaflets. Spores simple.

## I. CLADONIA, *Hoffm.*

Thallus either tubulose or laciniiform, podetia generally dilated at the apex into scyphi; thallus generally foliolose, or squamulose at the base, sometimes only granuloso-crustaceous. Apothecia variously coloured, but never black, internally hollow. Spores small, oblong.

### SUB-GENUS I. PYCNOTHELIA. *Ach. Duf. Nyl.*

Thallus crustaceous; podetia clavate, papillæform, simple or branched, glabrous; apothecia fuscous.

* *Reaction, (K+C—).*

1. *P. papillaria*, Duf. pale and yellowish, *granuloso-crustaceous;* podetia small (½ inch), erect, *clavato-cylindrical*, simple or branched.

Heathy ground, not common.

SYN:—Duf. Rev. Clad. 5. (1818). Nyl. Syn. 185.
FIG:—E. Bot. t. 907. Dill. t. xvi. f. 28. Sturm D. F. t. 22.
EXS:—Leight. 208.
GEOG. DISTRIB:—Europe, N. America.
BOT. PROV:—2...5...7, 8...10, 11, 12...15, 16...19. .23, 24...26.

ENGLAND :—Westmoreland! *Mrs. Stanger.* Yorkshire! *Messrs. Dixon & Mudd.* Bournemouth, Hants! *Rev A Bloxam.* Craigforda. *Rev. T. Salwey.* Ravensworth; Butsfield; Woodlands; Eglestone; Durham; Cheviot; Hedgehope; Wallington Moors, Northumberland. *Mr. Winch.* Ardingley Rocks! Sussex. *Mr. Joshua.*

SCOTLAND :—Appin! *Capt. Carmichael.* Ben Nevis! *Sir W. J. Hooker.* Loch Callater! *Mr. Croall.*

IRELAND :—South of Ireland *Dr. Taylor.* Howth. *Adm. Jones.* Doneraile Mountains; Kilkee. *Mr. Carroll.* Killarney. *Miss Hutchins.* near Belfast. *Mr. Templeton.* Donghruagh Mountain! co. Galway. *Mr. Larbalestier.*

WALES :—Near Barmouth; Llandrindod Wells, Radnorshire. *Rev. T. Salwey.* Llyn Crafnant!

### SUB-GENUS II. CLADONIA. *Hoffm. Nyl.*

Thallus leafy; podetia scyphiphorous or branched, more or less pulveraceous and squamose; apothecia terminal, biatorine, pale or red.

#### A. *Phæocarpæ, apothecia fuscous or pale.*

#### * *Reaction, (K f + C +).*

1. *C. endiviæfolia*, Fr. thallus *macrophylline*, spreading, yellow-green above, whitish beneath, *laciniæ* (1—2 inch) long, *multifid, rotundo-crenate at the apex;* podetia rare, small, cylindrical, from upper surface of the laciniæ; apothecia pale or fuscous.

Dry heaths and rocks, rare.

Distinct from *alcicornis*, (K—C +) by the different reaction.

SYN :—Fr. L. E. 212. (1831). Nyl. Syn. 189.
FIG :—E. Bot. t. 2361. Mich. Gen. t. 24. f. 3.
EXS :—Schær. 456. Nyl. 106. Larbal. 56.
GEOG. DISTRIB :—Switzerland, Italy, Spain, Portugal, Algeria, Canaries.
BOT. PROV :—1, 2, 3, 4...6...15...20.. 31.
ENGLAND :—Surrey. *Mr. Dickson.* (1795). Yarmouth. *Mr. D. Turner.* Newhaven, Sussex; Start Point, Devon; Esher, Surrey. *Mr. Borrer.* Rackham Common! Sussex. *Mr. Jenner.* Lustleigh Cleve, near Moreton, Devon. *Mr. Parfitt.* Hightor; Bottor Rock, Devon. *Messrs. Jones and Kingston.*
SCOTLAND :—Carse of Ardesier! *Mr. Croall.*
IRELAND :—Glengariff. *Adm. Jones.*
WALES :—Giltar Point, Tenby! *Rev. T. Salwey.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey! *Mr. Larbalestier.*

#### ** *Reaction,* (K + C + ).

2. *C. pungens*, Flk. thallus squamulose, evanescent; podetia *fruticose*, (1—3in.) erect, *much and intricately-branched*, attenuato-subulate, and divergenti-furcate at the apex, pale *greyish green*, glabrous, *more or less sub-decorticate, or adnately verrucose, and squamose;* apothecia small, subsphærical, pale.

Hilly slopes, common. 1812.

SYN :—Flk. Clad. 156. (1828) Nyl. Syn. 107.
FIG .—E. Bot. t. 2444. Dill. t xvi f. 30
EXS :—Leight, 16. 369 374.
GEOG. DISTRIB :—Europe, Africa, India, Tropical America, S America, Australasia.
BOT. PROV :—2, 3, 4...7...15...26.
ENGLAND :—Esher Common! Surrey. *Mr. Borrer.* (1812) Thetford! *Sir W. J. Hooker.* Basingstoke! Kent, and Winchfield! Hants. *Mr. R. S. Hill.* Morant's Court Hill; Lydd Beach, Kent. *Mr. Holmes.*
SCOTLAND :—Tay Bank, West Water; White Hill; Baldoran Woods! Forfarshire. *Mr. W. Gardiner.* Blaeberry Hill! Perth. *Dr. Lindsay.*
IRELAND :—Near Tully! co. Galway. *Mr. Larbalestier.*

WALES :—Barmouth.
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

A foliaceous form ( f. *foliosa*, Flk = Mudd Brit. Clad. 56 !) in a dense entangled depressed mass, occurs in Durham ! Kent ! and Leicestershire ! and Hants ! and is identical with *nivea*, Ach. spec. in hb. Kew !

The smooth pale greyish-green cortex is more or less parted by irregular whitish reticulations, and often becomes sub-decorticate, with adnate verrucæ. which sometimes are developed into scales or leaflets. This is also the case in *furcata*, but the different chemical reaction will always distinguish them.

3. *C. turgida*, Hffm. *whitish or glauco-cinerascent*, basal leaflets laciniiform, variously divided and crenate, more or less ascending, *podetia smooth*, *squamoso-decorticate*, *turgido-cylindrical*, branched, slightly dilated, and *open* at the truncate, dentato-radiate apices.

In rocky mountain ranges, rare. 1870.

SYN :—Hffm. Fl. Germ. 124. (1795). Nyl. Scand. 55. Crombie En. 20. *Bœomyces parecha*, Ach ! Syn. 350.
EXS :—Fellm. 37. Tuck. 24. Fries 147. (fide Nyl).
GEOG DISTRIB :—Northern Europe, Asia, Himalayas, N. America, Chili.
BOT. PROV :—15.
SCOTLAND :—Braemar, Grampians. *Rev. J. M. Crombie.* (1870). Moffat. *Rev. W. Johnson.*

4. *C. Lamarckii*, (Del.) according to Nyl. in Flora 1875 p. 447 is represented by Coem. Clad. Belg. 91 & 93, and is distinguished by K tinging the thallus of a slight yellow which quickly changes to a pale ochraceous tint and by the impervious scyphi. It is said to have been found on the ground, rare, (1875.) at Appin, Argyleshire, by *Rev. J. M. Crombie.*

*** *Reaction*, (*K* + *C*—).

5. *C. cervicornis*, Schær. thallus *macrophylline*, *cæspitose*, subcrect, *narrowly laciniato-multifid*, crenate, cartilaginous, glaucous-green above, white beneath, purplish-black at the base ; podetia from disk of laciniæ, short, slender, *smooth or subverrucose*, scyphiferous ; *scyphi simple and leafless, or irregularly proliferous, and more or less squamose.*

Hills and rocky places, common. 1782.

SYN :—Schær. Enum. 195. (1850). Nyl Syn. 197, in part ; a. and b. Mudd Brit. Clad. 4. *Cl. gracilis a*, Mudd Man. 54.
FIG :—E. Bot. t. 2574.
EXS :—M. & N. 749. Schær. 457.
GEOG. DISTRIB :—Europe, Anstralasia.
BOT. PROV :—1...3...5...7...10, 11...13, 14, 15, 16...18, 19...26...31.
ENGLAND :—Dartmoor ! Rusthall Common ! Kent. *Mr. Borrer.* Yorkshire ! *Mr. Mudd.* Butsfield, Durham. *Mr. Winch.* Rusthall Common, Kent. *Mr. Jenner.* West Allen, Carrs, Northumberland. *Rev. W Johnson.* Shropshire !
SCOTLAND :—Pentland Hills, near Edinburgh. *Sir J. E. Smith.* (1782). Highlands ! *Sir W. J. Hooker.* Sidlaw Hills ! *Mr. W. Gardiner.* Ben-na-Bourd ! *Mr. Croall.* Long Island ; Hebrides ; Arran. *Prof. Balfour.* Hartfell, Moffat. *Dr Nichol.* Dunearn. *Dr. Greville.* Succoth Hill, Arroquhar ! *Mr. Mc Kinlay.*
IRELAND :—Bantry. *Miss Hutchins.* Killarney. *Dr. Carrington.* River Dawros ! Salrock Road ! Kylemore ! co. Galway. *Mr. Larbalestier.*
WALES :—Barmouth ! Llyn Crafnant ! Cwm Cywion ! Gwydir Woods ! Bettws-y-coed.
CHANNEL ISLANDS :- Guernsey. *Rev. T. Salwey.* Jersey ; Sark. *Mr. Larbalestier.*

Laciniæ frequently more or less thickened, and slightly recurved at the margins, rimoso-reticulate on upper surface, obscurely longitudinally veined beneath, and minutely verrucose at apex, but these characters do not seem constant.

The different reaction keeps this distinct from *gracilis*, *verticillata*, and *sobolifera*.

F. *stipata*, Nyl. (in Flora 1876 p. 239) basal squamæ elongate, sublinear, *crenato-incised*, erect, stipate, rarely fertile.

On rocks.

IRELAND :—Kylemore, co. Galway. *Mr. Larbalestier.* (1876.)

6. *C. cariosa*, Flk. thallus ashy-green, scales minute, crenate, more or less investing the base of the podetia; podetia whitish, ½—1 in. high, cylindrical, dilated upwards, *carioso-cancellate or eroso-lacunose*, *granulato-verrucose*, scyphi digitato-partite, fastigiate.

On the earth, rare. 1832.

The re-action separates from *pyxidata*, *pityrea*, *decorticata*, *degenerans*, *botrytes* and *mitrula*.

I have seen small specimens from Ireland, similar to "*forma juvenilis*," Hepp 541 and 542, and probably referable to *symphycarpa*, Ach! in hb. Kew. L. *microphyllus*, E. Bot. 1782 is referable to *leptophylla* of *C. pyxidata*.

SYN :—Flk. Clad. 11. a. (1828). Nyl. Syn. 194. Mudd Man. 55.

FIG :—E.Bot. Suppl. t. 2761.

EXS :—M. & N. 850. Schær.510.

GEOG. DISTRIB :—Europe. N. America.

BOT. PROV :—2...4...10, 11...13...19.

ENGLAND :—Teesdale! *Mr. Robertson.* (1832). Lound Heath, near Yarmouth. *Mr. D. Turner.* Horsmonden! Sussex; Ecclesbourne, near Hastings. *Mr. Jenner.* St. Leonard's Forest! Sussex. *Mr. Borrer.*

SCOTLAND :—Lochaber. *Rev. J. M. Crombie.*

IRELAND :—Near Bantry! *Miss Hutchins.*

7. *C. delicata*, Flk. thallus *cæspitose*, *microphylline*, white or brownish-grey, *leaflets minute*, *eroso-laciniate*, laciniæ narrow, *minutely incised or crenate and granular at the margins;* podetia slender, simple or divided, ¼ in., thickened upwards, cartilaginous, glabrous, longitudinally ribbed or fissured, more or less with granular scales.

On old rails, not common.

The reaction (K + C—) distinguishes this from *cæspititia*, Flk. (K—C—), from *squamosa*, Hffm. (K—C—), from *pyxidata*, *var. pityrea*, (K—C—), and that and the characters of the podetia, would seem to ally this with *cariosa*.

SYN :—Flk. Clad. 7. (1828). Nyl. Syn. 210, in part; *Scyphophorus parasiticus*, Hook. Brit. 237. *Cenomyce parasitica*, Mack. Hib. 80.; *Cladonia squamosa v. delicata*. Mudd Man. 56. Brit. Clad. 21.

FIG :—E. Bot. t. 2052.

EXS :—Leight. 382.

GEOG. DISTRIB:—Europe, Tropical America.

BOT. PROV :—2, 3, 4, 5..10, 11.. 16.

ENGLAND :—St. Leonard's Forest! Sussex. *Mr. Borrer.* Stone Wood, near Greenhithe; Chelsfield, Kent. *Mr. Holmes.* Barham, Suffolk, and Holt Wood! *Sir W. J. Hooker.* Yorkshire! *Mr. Mudd.* Bagot's Park! Staffordshire. *Rev. A. Bloxam.* Lanchester, Durham; Dilstone Park, Cheviot, Northumberland. *Mr. Winch.* Herefordshire! Shropshire!

SCOTLAND :—Appin. *Capt. Carmichael.*

IRELAND :—Common. *Dr. Taylor.*

Var. *subsquamosa*, Nyl. thallus *squamulose;* podetia whitish, (1—2 in.), partially glabrous, cartilaginous, longitudinally ribbed or fissured, *clothed at intervals at the base with spreading incised and crenate scales*, *granulate in the upper part*, *branched*, *radiato-cristate*, *subcorymbose*.

Woods and rocks, rare.

Different reaction keeps this distinct from *pyxidata var. decorticata*, and from *squamosa*.

SYN :—*Cladonia squamosa*, Nyl. Syn. 209 in part; *Scyphophorus sparassus*, Hook. Brit. 2. 237. in part; *Cenomyce sparassa*, Mack. Hib. 80.

EXS :—Leight. 405. Bohl. 16. Schær. 74.

GEOG. DISTRIB :—N. Europe, N. America, S. America, India.

BOT. PROV :—3...5...8...10...19...26.

ENGLAND :—Yorkshire! *Mr. Mudd.* Leicestershire! *Rev. A. Bloxam.* Bolsley, near Thirsk! *Mr. J. G. Baker.* Ightham Common, Kent. *Mr. Holmes.* Shropshire! *Rev. T. Salwey.*

IRELAND :—Dunkerron. *Dr. Taylor.* Killarney. *Mr. Carroll.* Kylemore! *Mr. Larbalestier.*

**** *Reaction*, (*K*—*C* + ).

8. *C. alcicornis*, Flk. thallus *macrophylline*, foliaceous, spreading, yellow-green above, white beneath, *laciniæ narrow, palmato-multifid, inciso-crenulate at apex, margins with black fibres;* podetia springing from upper surface of laciniæ.

Dry heaths, not common.

Smaller and narrower than, but similar in general appearance to *endiviæfolia*, from which the above characters, and the different reaction keep it distinct.

SYN :—Flk. Clad. 23. (1828). Nyl. Syn. 190; *Scyphophorus alcicornis*, Hook. Brit. 238; Scot. 62. *Cladonia endiviæfolia var. alcicornis*, Mudd Man. 52. Brit. Clad. 3.

FIG :—Dill. t. xiv. f. 12. A.; Vaill. Paris. t. 21. f. 3.

EXS :—Leight. 15.

GEOG. DISTRIB :—Europe, Africa, America.

BOT. PROV :—1...3, 4, 5...10, 11...14, 15...19...31.

ENGLAND :—Near Hengrave, Suffolk and Aldborough! *Sir T. Gage.* Yorkshire. *Mr. Mudd.* Worcestershire. *Rev. J. H. Thompson.* Houghton Moor, Yorkshire. *Mr. Teesdale.* Northumberland and Durham. *Mr. Winch.* Malvern Hills, Worcestershire; Morf, Salop. *Mr. Purton.* Dartmoor. *Messrs. Jones and Kingston.* Lydd Beach, Kent. *Mr. Holmes.* Shropshire!

SCOTLAND :—Pentland Hills and Dunearn, Edinburgh. *Dr. Greville.* Grampians, *Rev. J. M. Crombie.* Isle of May, Firth of Forth. *Mr. Sadler.*

IRELAND :—Killarney. *Dr. Carrington.*

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey, Sark. *Mr. Larbalestier.*

***** *Reaction*, (*K*—*C*—).

9. *C. pyxidata*, Fr. thallus squamulose, ashy-green; podetia *cartilagineo-corticate*, verrucose, or coarsely granulato-pulveraceous, or scaly downwards; scyphi *cyathiform*, more or less proliferous.

Heaths, woods, hedge banks, common.

SYN:—Fr. L. E. 216. (1831); Nyl. Syn. 192. Mudd Man. 53. Brit. Clad. 7. *Scyphophorus pyxidatus*, Hook. Brit. 238; *Cenomyce pyxidata*, Hook. Scot. 62; *Cenomyce coccifera*, Mack. Hib. 81. in part.

FIG :—Dill. t. xiv. f. 6. A, f. 6. C, f. 6. I—M, f. 9. A. E. Bot. t. 1393.

EXS :—Leight. 407.

GEOG. DISTRIB :—Europe, India, N. & S. America, Australasia.

LOCALITIES :—Generally throughout England, Scotland, Hebrides, Ireland, N. and S. Wales, and Channel Islands.

It seems only to create perplexity, to attempt to describe or particularize the innumerable modifications of this polymorphous species, which in reality have no definite limit, and arise from local circumstances of climate, humidity, &c. They may be all readily referred to the following varieties, by careful attention to the prominent character.

Var. *vera pyxidata*, podetia continuously corticate, *granulato-verrucose*.

EXS :—Leight. 437!

Var. *pityrea*, Ach. podetia *pulverulento-granuloso-furfuraceous*, ashey-white, *smooth and decorticate*, and often ribbed or laciniose in the *upper* part.

GEOG. DISTRIB :—Europe, India, N. and S. and Tropical America, Africa, Australasia.

In the Hookerian herb. at Kew there are specimens gathered at Killarney, (hb. D. Turner) and Forfarshire, (A. Croall) identical with *acuta*, Tayl. which appears to be only a subulate form of *pityrea*.

Var. *chlorophæa*, Flk. podetia *pulverulent, granules coarser* at the base, *sulphury-yellow*.

EXS :—Larbal. 58.
GEOG. DISTRIB :—Europe, Africa, N. and S. and Tropical America, Australasia.

Var. *cæspititia*, Flk. thallus *cæspitose compressed*; leaflets *laciniato-lobate*, margins *crenate, or eroso-laciniate ;* podetia arising from disk of laciniæ, *very short*, simple or divided, glabrous, subcostate, sometimes sub-verrucose or scaly ; *apothecia conglomerate, apparently sessile, pale flesh-brown.*

On earth and rocks, not common.

Coëmans in Clad. Achar. says he has frequently observed the transition from *pityrea* into *cæspititia*. The different reaction separates it from *delicata*.
SYN :—Flk. Clad. 8. (1828). Nyl. Syn. 1. 210. *Scyphophorus cæspititius*, Hook. Brit. 236 ; *Cladonia squamosa var cæspititia*. Mudd Man. 57. Brit. Clad. 21.
FIG :—E. Bot. t. 1796. (orig. spec.in hb. Borrer !)
EXS :—Leight. 368 ! Mudd Clad. Brit. 44 ! Bohl. 72 !
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—2, 3...5...7...11, 12...15...19...26...31.
ENGLAND :—Hampshire ! *Mr. Lyell.* Ardingley ! Sussex. *Mr. Jenner.* Hassocks ! Sussex, and on Hungershall Rocks ! *Mr. Borrer.* Oldbury Hill, Ightham Kent. *Mr. Jenner.* Craigforda. *Rev. T. Salwey.* Pamber Forest, Hants. *Rev. J. M. Crombie.* Heaton Deane, Northumberland. *Mr. Winch.* Foreshield, Alston, Cumberland. *Rev. W. Johnson.* Shropshire !
SCOTLAND :—Loch Katrine ; Lochaber. *Rev. J. M Crombie.*
IRELAND :—*Miss Hutchins & Sir T. Gage ! !* Killarney. *Dr. Carrington.* near Lough Inagh, Galway. *Mr. Larbalestier.*
WALES :—Hill above Bodowen, Barmouth. *Rev. T. Salwey.*
CHANNEL ISLANDS :—Gorey ; Rozel ; Jersey. *Mr. Larbalestier.*

Var. *leptophylla*, Flk. thallus *squamulose, squamules small, dispersed, rounded, nearly entire* ; podetia short, simple or divided, glabrous or subverrucose, subcostate ; apothecia solitary, *capitate*, brown.

Wet heathy places, rare.

Of this I have seen no British specimens, but possess an authentic one from Dr. Nylander, collected in Java, 7000 ft. alt. Coëmans (Clad. Achar.) states that the Acharian herbarium at Helsingsfors, contains a specimen of this lichen from England, and that he considers it as a variety of *cariosa*, which it certainly generally resembles, but the different reaction keeps them quite distinct.
SYN :—Flk. Clad. 19. (1828). Nyl. Syn. 193. *Scyphophorus microphyllus*, Hook. Brit. 237 ; *Cladonia squamosa var. leptophylla*, Mudd Man. 57 ; *Cladonia cariosa var. leptophylla*, Mudd Brit. Clad. 6.
FIG :—E. Bot. t. 1782.
EXS :—Coëm. Clad. Belg. 22 ! Hepp 543 !
GEOG. DISTRIB :—France, Switzerland.
BOT. PROV :—2.
ENGLAND :—Tilgate and St. Leonard's Forests, Sussex. *Mr. Borrer.*

Var. *fimbriata*, Hoffm. thallus white, squamulose ; podetia *membranaceo-corticate*, deliquescing into a *fine white impalpable powder*, sometimes scaly from the base upwards.

SYN :—Hoffm. Fl. Germ. 121 (1795.) Nyl. Syn. 194.
FIG :—Dill. t. xiv. f 8. f. 16. A. B. D. F. G.—Vaill. Paris. 21. f. 6.—8. E. Bot. t. 2438.
EXS :—Leight. 325 ! 376 ! 377 ! Mudd Brit. Clad. 13 ! 14 ! 15 !
GEOG. DISTRIB :—Europe, Africa, India, N. & S. & Tropical America, South Atlantic, Australasia, South Indian Ocean.
BOT. PROV :—1, 2...11.

Of this common lichen, there are two conspicuous forms or states :—*tubæformis* in which the podetia are elongated and *trumpet-shaped* (Schær. L.H. 58 ! and Leight. 377 !) : and *cornuto-radiata*, in which the podetia are very much elongated, simple, *cornute*, or irregularly scyphiferous and *radiato-fimbriate*. (Leight. 376 ! and Mudd Br. Clad. 19 !)

ENGLAND :—Bexhill, Eastbourne. *Mr. Roper*. North Bovey, Hightor Down, &c., Devon. *Messrs. Jones and Kingston*. Swinnop, East Allendale, Northumberland. *Rev. W. Johnson*.

*f. costata*, Flk. (Clad. 66) podetia granuloso-pulverulent, at length denuded, and discovering their costate substance.

Near Kylemore, co. Galway. *Mr. Larbalestier*. (1876).

Var. *decorticata*, Flk. podetia elongated, cylindrical, attenuated, *white, decorticate, squamose at the base, coarsely granulato-pulverulent above*.

SYN :—Flk. Clad. 10. (1828) Nyl. Syn. 193.
EXS :—Coëm. Clad. Belg. 95 ! 99 !
GEOG. DISTRIB :—Africa, India, N. Tropical and S. America, Australasia.
BOT. PROV :—7, 8...15, 16...20.
ENGLAND :—Leicestershire ! *Rev. A. Bloxam*.
SCOTLAND :—Killin ; Grampians. *Rev. J. M. Crombie*.
IRELAND :—Kilmore, near Fermoy ! *Mr. Carroll*.
WALES :—Aberdovey ! *Rev. A Bloxam*,

10. *C. gracilis*, Hoffm. thallus pale ashey-green or livid brown, leaflets at the base often evanescent ; podetia elongate, *filiform, subulate*, or *scyphiferous and proliferous, corticate, glabrous ;* apothecia pedicillate or sessile, fuscous.

Mountains and heaths, common.

Of the primary robust scyphiferous and proliferous form *hybrida*, (Ach.) represented by Dill. t. XIV, f. 13. B. and Schær.66 ; nor of the robust gigantic extended form *macroceras*, (Ach ) represented by Schær, 68 ; nor of the slender elongated form *elongata*, Ach. represented by Tuck. 28 ; nor of the squamulose form, *aspera*, Flk. represented by Schær. 67. 641 ; nor of the var. *cornuta* (*C. cornuta*, Fr. 225. Nyl. Syn. 198.) podetia stout, elongate, chiefly subuliformi-cornute,a few with narrow irregular subradiate scyphi, glabrous at the base, and subpulverulent above, represented by Anzi Clad. Cisalp. 9 Fellm. Lapp. Or. 31 ; I have seen no British specimens, except a doubtful one of this latter from Ireland, Miss Hutchins in hb. Hook.

SYN :—Hoffm. Fl. Germ. 119. (1795) Nyl. Syn. 196. Mudd Man. 54 in part. Brit. Clad. 16 ; *Scyphophorus gracilis*, Hook. Brit, 239 ; *Cenomyce gracilis*, Hook. Scot. 63 ; Mack. Hib. 82.
GEOG. DISTRIB :—Europe, N. and S. America, Australasia, India.

The forms or varieties which occur in Britain are these :—

Var. *chordalis*, (Ach.) podetia slender, *subuliform*, with *narrow cup-shaped* scyphi *denticulate* on the margins.

SYN : —Ach. Syn. 262 (1817).
FIG :—E. Bot. t. 1284.
EXS :—Schær. 64. Leight. 296. Mudd Br. Clad. 34 ! 35 ! 37 !
GEOG. DISTRIB :—Europe, Arctic and Antarctic America.
BOT. PROV :—1, 2, 3, 4, 5...7...10, 11, 12...14, 15...19...30, 31.
ENGLAND :—Yorkshire ! *Mr. Mudd*. Aldershot ! Hants, *Mr. R. S. Hill*. Keswick ! *Mrs. Stanger*. Blackstone Rock, Devon. *Mr. Parfitt*. Northumberland and Durham. *Mr. Winch*. Malvern Hills, Worcestershire. *Mr, Purton*.

Lydd Beach, Kent. *Mr. Holmes.* Tuddenham Heath, Suffolk. *Rev. E. N. Bloomfield.* Leith Hill, Surrey. *Mr. W. Joshua.* Tiptree Heath, Essex. *Mr. Varenne.* Longmynd! Wrekin! Stiperstones! Shropshire.

SCOTLAND :—Glen Callater! Lion's Face! and Sidlaw Hills! and Morne! *Mr. Croall.* Ben Lawers! *Mr. D. Turner.* Pentland Hills. *Dr. Greville.*

IRELAND :—Derry. *Dr. Moore.* Bantry! *Miss Hutchins.*

WALES :—Barmouth!

CHANNEL ISLANDS :—Guernsey, *Rev. T. Salwey.* Jersey, Sark, &c. *Mr.. Larbalestier.*

Var. *abortiva*, Schær. podetia subuliform, recurved or hooked at the apex, sterile.

EXS :—Schær. L. H. 69! Mudd Br. Clad. 36!

ENGLAND :—Yorkshire! *Mr. Mudd.*

Var. *ocrochlora*, Flk. Clad. 75. Nyl. Syn. 198. a smaller form of about one inch high of *cornuta*, represented by Schær. 640! Mudd Br. Clad. 23! 24! 25! 26!

Rare, Cleveland, Yorkshire! *Mr. Mudd.*

11. *C. verticillata*, Flk. thallus foliaceo-squamulose, leaflets laciniæform, crenato-incised; podetia ashey-grey, corticate, glabrous or subverrucose, scyphiferous, scyphi denticulate at the margins, 2—4 *times repeatedly verticillato-proliferous and scyphiferous from centre of scyphi;* apothecia fuscous.

Rocks and mountainous districts, rare.

SYN :—Flk. Clad. 26. (1828). Nyl. Syn. 1. 197; *Cladonia gracilis v. verticillata*, Mudd Man. 54; *Cladonia cervicornis v. verticillata*, Mudd Br. Clad. 5.

FIG :—Dill. t. xiv. f. 6. G. H. – Vaill. Paris. 21. f. 5.

EXS :—M. & N. 644! Mudd Brit. Clad. 3!

GEOG. DISTRIB :—Europe, N. America, Australasia.

BOT. PROV :—2...7...10...26...31.

ENGLAND :—Yorkshire! *Mr. Mudd.* Broadwater Forest, Tunbridge Wells! *Mr. Jenner.*

IRELAND :—Kylemore Pass! co. Galway. *Mr. Larbalestier.*

WALES :—Barmouth!

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

Var. *sobolifera*, Del. thallus foliaceous, laciniæ narrow, inciso-crenate, glaucous-green above, whitish beneath, podetia ½—¾ in. high, *cylindrical*, glabrous, subverrucose, sometimes leafy, *dilated upwards into a scyphus, whose margins are denticulato-dilated, sub-cymoso-proliferous with leaflets interspersed;* apothecia small, simple, convex or conglomerate, fuscous.

Rocky mountains, probably not unfrequent, but confounded with *cervicornis*, from which the different reaction distinguishes it.

SYN :—Del. in Dub. Bot. Gall. 631. (1830); *Cladonia verticillata b. phyllophora*, Flk. Clad. 28! *Cladonia cervicornis v. prodiga*, Ach. L. U. 532.

FIG :—E. Bot. t. 1392. looks much more like this than *alcicornis.*

EXS :—Leight. 14. Mudd Brit. Clad. 2.

GEOG. DISTRIB :—Europe, N. & Tropical America, Africa, India.

BOT. PROV :—4, 5...7...10.

ENGLAND :—Yorkshire! *Mr. Mudd.* Lound! *Mr. D. Turner.* Caer Caradoc! Wrekin! Laurence Hill! Shropshire.

IRELAND :—Ballyedmond, co. Cork. *Mr. Wright.*

WALES :—Barmouth! Holyhead Mountain!

12. *C. degenerans*, Flk. thallus squamulose; podetia whitish or brown, cartilaginous, glabrous, *nigrescent* and *albo-guttate at the base*, scyphophorous, scyphi proliferous, cristato-ramose.

Heaths and mountains, rare.

SYN :—Flk. Clad. 41. (1828) Nyl. Syn. 199.
GEOG. DISTRIB :—Europe, N. America, Australasia, India.
BOT. PROV :—15...31.
SCOTLAND :—Craig Nick. *Mr. W. Gardiner*, everywhere common in the Grampians. *Rev. J. M. Crombie.*
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

Forma *anomœa*, (Ach.) podetia covered with leafy scales.

SYN :—Hook. Brit. 238. Scot. 63. Grev. Edin. 344.
FIG :—E. Bot. t. 1867.
BOT. PROV :—3, 4...14...23.
ENGLAND :—Woolwich Barn. *Sir J. E. Smith.* Lakenham. *Mr. Turner.*
SCOTLAND :—Pentland Hills, near Edinburgh. *Sir J. E. Smith.*
IRELAND :—Kelly's Glen. *Dr. Moore.*

13. *C. furcata*, Hffm. thallus squamulose, evanescent; podetia elongated, pale whitish or brownish green, *fruticose*, *glabrous*, *branched*, *branches attenuato-subulate*, *divergenti-furcate*; apothecia small, fuscous.

Heaths and mountains, frequent.

Reaction distinguishes *furcata* from *pungens*.
SYN :—Hffm. Fl. Germ. 115 (1795); Nyl. Syn. 1. 205; Hook. Brit. 236. Scot. 64: Mack. Hib. 80. Mudd Man. 57.
FIG :—Dill. t. xvi. f. 27. A & C.
EXS :—Leight. 401. Mudd 16. Mudd Br. Clad. 50! 51! 53! (small form).
GEOG. DISTRIB :—Europe, N. and S. and Tropical America, India, Australasia.
BOT. PROV :—1..3, 4, 5...7, 8. 9, 10...14, 15, 16...18, 19...31
ENGLAND :—Yorkshire! *Mr. Mudd.* Kent! *Mr. R. S. Hill.* Leicestershire! *Rev. A. Bloxam.* Lound Heath! *Mr. D. Turner.* Suffolk! *Sir W. J. Hooker.* Whitley Read, Cheshire! *Mr. W. Wilson.* Shotover Hill, Oxford. *Mr. Baxter.* Braxted, Essex. *Mr. Varenne.* Market Rasen; Lincolnshire. *Dr. F. A. Lees.* Dartmoor; North Bovey; Highton Down, Devon. *Messrs. Jones & Kingston.* Shropshire! Moor Park, Herefordshire!
SCOTLAND :—Balmerino! Falls of the Garrawalt! Cairn-a-Drochell! White Hill! Forfarshire. *Mr. W. Gardiner.* Morne! *Mr. Croall.* Hebrides; Arran. *Prof. Balfour.* Dunearn and Pentland Hills. *Dr. Greville.*
IRELAND :—Killarney. *Dr. Carrington.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey, Sark, &c. *Mr. Larbalestier.*
WALES :—Moel-y-gest near Tremadoc.

Var. *racemosa*, Flk. podetia like those of the type, leafy or scaly.

FIG :—Dill. t. xvi. f. 27. B.
EXS :—Mudd Br. Clad. 46! 47!
LOCALITIES :—Yorkshire! *Mr. Mudd.* Ben Cruachan! *Mr. Borrer.* Killarney. *Dr. Carrington.* Pentland Hills. *Rev. J. Lightfoot.* North side of Orrock Hill. *Dr. Greville.* Channel Islands. *Mr. Larbalestier.*

Var. *recurva*, Hffm. podetia recurved, leafy.

SYN :—Mudd Man. 58, Br. Clad. 22.
FIG :—Dill. t. xvi. f. 27 D.
EXS :—Mudd Br. Clad. 48! 49! 52!
LOCALITIES :—Yorkshire! *Mr. Mudd.* Leicestershire! *Rev. A. Bloxam.* near Beddgelert, N. Wales! *Mr. D. Turner.* Channel Islands. *Mr. Larbalestier.* Shropshire!

Var. *spinosa*, Flk. Hook. Brit. 236. *Cenomyce racemosa*, Hook. Scot. 64; Mack. Hib. 80.

FIG :—Dill. xvi. f. 25.
SCOTLAND :—Pentland Hills. *Rev. J. Lightfoot.*

Var. *adspersa* Flk. podetia elongate, squamoso-furfuraceous, sparingly branched, branches subsimple.

IRELAND :—Tully, Kylemore. *Mr. Larbalestier.* (1875.)

14. *C. scabriuscula*, Del. podetia cæspitose erect, apices *scabrid, turgid, pulverulento-foliose*, branched, apices furcate recurved, branches subalternate intricato-divaricate; apothecia terminal, large, irregularly globose, subfuscous.

On mossy rocks, rare. 1875.

SYN :—Duby Bot. Gall. 623 (1829.) Nyl. in Flora 1875. p. 447.
FIG :—Dill. t. 16. f. 27. E.
EXS :—Coëm. Clad. Belg. 173. B. & 175.
GEOG. DISTRIB :—France, Belgium.
BOT. PROV :—16.
SCOTLAND :—Barcaldine, Argyleshire. *Rev. J. M. Crombie.* (1875.)

15. *C. crispata*, (Ach.) *whitish, or pallido-cinerascent or subspadiceous*, basal leaflets small, incised and crenate; *podetia glabrous*, branched, 3 or 4 times iterato-proliferous, *apices and axils infundibuliform*, open, the *apertures denticulato-cristate* at the margins.

In mountain ranges, very rare. 1869.

SYN :—Ach. Syn. 272. (1817). Nyl. Syn. 207. Crombie En. 20.
EXS :—Tuck. 31.
GEOG. DISTRIB :—N. Europe, N. America.
BOT. PROV :—15.
SCOTLAND :—Ben-a-boord. *Rev. J. M. Crombie.* (1869.)

16. *C, squamosa*, Hffm. thallus squamulose; podetia cæspitose, whitish-green, cylindrical, 2in. high, erect, *repeatedly branched, proliferously denticulate, or subulate* from margins of the minute irregular scyphi, *apices rigid subcorymbose radiato-cristate*, glabrous, longitudinally sublacunose, *cortex entire, clothed with minute leaflets or scales;* apothecia clustered, fuscous.

Mossy woods, not uncommon.

Distinguished from *delicata var. subsquamosa* by different reaction; from *pyxidata v. decorticata* by the *entire* cortex and the podetia *throughout clothed with scales;* and from *furcata f. adspersa*, Flk. by different habit.

SYN :—Hffm. Fl. Germ. 125. (1795) Nyl. Syn. 209 (in part); a. & b. Mudd Man. 56; a. in part Mudd Br. Clad. 19; *Scyphophorus sparassus*, Hook. Brit. 237. (in part); *Cenomyce sparassa*, Hook. Scot. 64 (in part); Mack. Hib. 80. (in part).
FIG :—E. Bot. t. 2362.
EXS :—Mudd Br. Lich. 13! Brit. Clad. 40! 41!
GEOG. DISTRIB :—Europe, N. and S. America, Africa, India, Australasia.
BOT. PROV :—1...5...7, 8 10, 11...15—19...26...31.
ENGLAND :—Charnwood Forest! Leicestershire! *Rev. A. Bloxam.* (=scabrosa Ach! in herb. D. Turner). Yorkshire! *Mr Mudd.* Hay Coppice, Herefordshire. *Rev. T. Salwey.* Northumberland and Durham. *Mr. Winch.* Bagtor, Rora, and Pen Woods, Ilsington, Devon. *Messrs. Jones and Kingston.*
SCOTLAND :—Sidlaw Hills and Glen Callater! *Mr. W. Gardiner.* Doune! *Mr. Mc Kinlay.*
IRELAND :—Killarney! *Mr. Drummond.* near Kylemore. *Mr. Larbalestier.*
WALES :—Hafod, Cardiganshire. *Sir J. E. Smith.* Lake above Llyn Bodlyn! *Mr. Borrer.* Cwm Bychan. *Rev. T. Salwey.* Conway Falls!
CHANNEL ISLANDS :—Guernsey, Jersey, Sark, &c. *Mr. Larbalestier.*

Forma *cucullata*, Del. thallus minute, foliaceous, laciniato-crenulate, *cucullate*, discoloured, above glauco-virescent, beneath whitish; podetia elongate, curvate, subramose, irregularly scyphiferous or attenuate, pale; apothecia terminal subfuscous.

On the earth, rare. 1876.

SYN :—Duby Bot. Gall. 626 (1829).
IRELAND :—Killery Bay near Kylemore, Galway. *Mr. Larbalestier.* (1876)

B. *Erythrocarpæ, apothecia red.*

*Reaction,* (K *f* + C + ).

15. *C. cornucopioides,* Fr. thallus squamulose, pale yellow-green, crenate and crenato-incised; podetia ½—1 inch, *granuloso-verrucose,* glabrous or minutely squamulose, simple, dilated upwards into *cyathiform* simple or proliferous scyphi; apothecia sessile or podicellate.

On earth, &c., common.

In the typical form, the scyphi are short and broadly dilated, on short glabrous granuloso-verrucose podetia. In the *extensa* form, the podetia are much more elongated, and the scyphi proliferous from the margins; and in the *phyllophora* form, the podetia and scyphi are entirely clothed with minute scales or leaflets. In the *pleurota* form (which also presents the above 3 states) the cortex of the podetia deliquesces into a fine dust, probably from growing in humid localities.

The glabrous verrucose state is analogous to *C. pyxidata,* and the pleurota or pulverulent state to *fimbriata* among the phæocarpæ.

SYN :—Fr. L. E. 236. (1831); Nyl. Syn. 220; *Scyphophorus cocciferus,* Hook. Brit. 240. *Cenomyce coccifera,* Hook. Scot. 63; Mack. Hib. 81. in part: *Cladonia coccifera var. cornucopioides,* A. & B. Mudd Man. 60. Brit. Clad. 28.

FIG :- E. Bot. t. 2051. Laur. in Sturm D. Fl. t. 23. a. and 25. (typica.)—t. 23. b. and c. (extensa)—t. 24 e. (phyllophora).

EXS :—(typica). Mudd Br. Clad. 65! Anzi Clad. Cisalp. 14. A.—(extensa) M. & N. 752! Mudd Br. Clad. 66!—(phyllophora) Anzi Clad. Cisalp. 14. B!—(pleurota typica). Anzi Clad. Cis. 15! (extensa). Tuck. L. Am. Sept. 37!—(phyllophora). Leight. 375!

GEOG. DISTRIB :—Europe, N. & S. America, India, Australasia.

BOT. PROV :—1, 2, 3, 4, 5, 6, 7, 8...10, 11...15 . 18, 19...31.

ENGLAND :—Shotover Wood; Bagley Wood, Berks! *Mr. Baxter.* Yorkshire! *Mr. Mudd.* Charnwood Forest! Leicestershire. *Rev. A. Bloxam.* Basingstoke! Hants. *Mr. R. S. Hill.* Rye-loaf Hill, near Settle. *Dr. Windsor.* Ampthill, Beds. *Rev. C. Abbot.* Northumberland and Durham. *Mr. Winch.* Bromsgrove Lickey; Ridgway; Malvern Hills, Worcestershire. *Mr. Purton.* Tors of Dartmoor; North Bovey, Devon, *Messrs. Jones and Kingston.* West Allen Carrs, Northumberland, *Rev. W. Johnson.* Caer Caradoc! Wrekin! Long Mynd! Stiperstones! Shropshire.

SCOTLAND :- Ben-na-Bourd and Braemar! Sidlaw Hills and White Hills! Forfarshire. *Mr. W. Gardiner.* Cawdor Wood! Nairn. *Mr. Croall.* Schehallion! *Sir W. J. Hooker.* Doune! *Mr. Mc Kinlay.* Ben Ferrog! *Mr. Borrer.* Callernish. *Dr. Lindsay.*

IRELAND :—Mangerton Mountain and Killarney! *Sir T. Gage.* Killarney. *Dr. Carrington.*

WALES :—Aberdovey! *Rev. A. Bloxam.* Barmouth!

CHANNEL ISLANDS :—Portalat Bay, Jersey. *Mr. Larbalestier.*

16. *C. vestita,* Ach. thallus foliaceo-squamulose; podetia 1—2½ inches high, *flavescent,* cylindrical, simple, corticate, glabrous, *cortex breaking into adnate or scabrous portions or verrucæ, which eventually become crenate squamules;* scyphi cylindrical, *narrow, simple,* or *shortly proliferously divided;* apothecia conglomerate.

Mountains, rare.

No doubt confounded with *bellidiflora,* which it much resembles, but distinct by different reaction.

SYN :—Ach. L. U. 541. (1810).

FIG :—Dill. xv. fig. 15. B. as to general form but not colour of apothecia.

EXS :—Th. M. Fr. L. Sc. 12. Anzi Clad. Cis. 16. A! Mass. 173! Schær. 40!

GEOG. DISTRIB :—N. America.

BOT. PROV :—15.

SCOTLAND :—Ben Ferrog! *Mr. Borrer.* Aberdeen! Ben-na-Bourd, Braemar! *Mr. W. Gardiner.*

17. *C. deformis*, Hffm. thallus foliaceous, leaflets pale green, inciso-crenate, whitish beneath; podetia 1—3 inches, leafless, *tubular*, *sulphureo-pulverulent*, turgid, simple, scyphiferous, scyphi regular or deformed, *margins erect*, *crenato-dentate*.

Shady woods, rare.

The podetia are cylindrical, leafless, thickened upwards, or sometimes turgid and narrowed under the scyphus, and are either entirely pulverulent, or corticate at the base, pulverulent above.

SYN :—Hffm. Fl. Germ. 120 (1795); Nyl. Syn. 222; *Scyphophorus deformis*, Hook. Brit. 240; *Cenomyce deformis*, Hook. Scot. 63; *Cladonia coccifera v. deformis*, Mudd Man. 61. *v. deformis a*, Mudd Brit. Clad. 30.

FIG :—E. Bot. t. 1374; Dill. t. xv. f. 18. A.

EXS :—Bohl. 29. Mudd. 25. Schær. 47. 48. 49.

GEOG. DISTRIB :—Europe, N. and S. America, India, Australasia.

BOT. PROV :—1, 2...5...10, 11, 12...14, 15, 16...23.

ENGLAND :—Yorkshire! *Mr. Mudd.* Westmoreland! *Mr. Robertson.* Amberley Wild Brook, Sussex! *Mr. Jenner.* Hay Coppice, Herefordshire. *Rev. T. Salwey.* Northumberland and Durham. *Mr. Winch.* Devon. *Messrs Jones and Kingston.*

SCOTLAND :—Appin. *Capt. Carmichael.* Ben-na-Bourd and Braemar! *Mr. Croall.* Pentland Hills. *Dr. Greville.* Ben Ferrog! *Mr. Borrer.* Glen Callater and Lin of Dee! Aberdeen. *Mr. W. Gardner.*

IRELAND :—Howth. *Dr. Moore.*

** *Reaction*, (K + C—).

18. *C. digitata*, Hffm. thallus foliaceous at base, leaves small, lobato-crenate, pale green above, white beneath; podetia *ochroleuco-pulverulent*, cylindrical, 1—2 inches, simple, scyphi narrow, *margin digitato-dentate incurved*, or dilated and proliferous.

Mossy woods, rare.

Podetia sometimes corticate at the base, pulverulent above, sometimes entirely pulverulent, either leafless, or often with a few scattered leaflets, or sometimes leafy at the base, the leaflets diminishing in size upwards.

Reaction, colour, and incurved margins of scyphi distinguish this from *deformis*.

SYN :—Hffm. Fl. Germ. 124 (1795); Nyl. Syn. 222; *Scyphophorus digitatus* (in part). Hook Brit. 240; *Cenomyce digitata*, Hook. Scot. 63; *Cladonia coccifera* $\epsilon$ & $\zeta$ *digitata*, Mudd Man. 61. Br. Clad. 31.

FIG :—Laur. in Sturm D. Fl. t. 15. 16.

EXS :—Schær. 44! 46! Nyl. 25!

GEOG. DISTRIB :—N. America, Australasia.

BOT. PROV.: -1 . 5...8...11...14, 15, 16...23.

ENGLAND :—Leicestershire! *Rev. A. Bloxam.* Wallington! *Sir W. C. Trevelyan.* Shropshire! *Rev. T. Salwey.* Oversley Wood. *Mr. Purton.* North Bovey; Moreton; Ilsington; Devon. *Messrs. Jones and Kingston.* Swinnop Fell, East Allendale, Northumberland. *Rev. W. Johnson.*

SCOTLAND :—Craig Koynoch! *Mr. W. Gardiner.* Arran. *Prof. Balfour.* Pentland Hills. *Dr. Greville.*

IRELAND :—Kelly's Glen. *Dr. Moore.*

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

Mudd, in his Manual, cites to his *digitata* E. Bot. t. 1836, which if it were not described as having *scarlet* apothecia, I should refer to some form of *furcata*. Certainly it does not represent the typical *digitata*, nor does E. Bot. t. 2439, which Hooker quotes as illustrative of *digitata*, but rather represents var. *macilenta f. polydactyla*. Mudd's specimens, 68, 69, 70, in his Br. Clad. from the incano-pulverulent colour approach *macilenta*.

Var.* *macilenta*, Hffm. thallus foliaceous or squamulose; podetia *incano-granuloso-pulverulent*, cylindrical, ½—1 in. high, slender, *simple*, sometimes shortly *divided at the apex*, *ascyphous*; apothecia terminal, tuberculose.

Mountainous turfy heaths, not unfrequent.

SYN :—Hffm. Fl. Germ. 126. p.p. (1795); Nyl. Syn. 223. *Scyphophorus filiformis*, Hook. Brit. 239. *Cenomyce filiformis*, Hook. Scot. 63; Mack. Hib. 82; *Cladonia coccifera* $\eta$, Mudd Man. 61. *Cladonia coccifera* $\epsilon$ *macilenta*, Mudd Br. Clad. 31.

FIG :—E. Bot. t. 2028.

EXS :—Schær. 33! 34! M. & N. 750! Hepp 113! Anzi Clad. Cis. 19 B. C. Mudd L. Br. 29!

GEOG. DISTRIB :—Europe, N. America, Australasia.

BOT. PROV :—1, 2...5...8 . 10, 11...14, 15...19...26.

ENGLAND :—Yorkshire! *Mr. Mudd.* Leicestershire! *Rev. A. Bloxam.* New Forest, Hants. *Mr. Lyell.* Edgefield! *Sir W. J. Hooker.* Cromford Moor, near Matlock. *Sir J. E. Smith.* Northumberland and Durham. *Mr. Winch.* Braxted Park Wall, Essex. *Mr. Varenne.* Ardingley Rocks, Sussex. *Mr. W. Joshua.* High Tor Down; Ruddy Brook, Bovey Tracey, Devon. *Messrs. Jones and Kingston.* Wrekin! Shropshire.

SCOTLAND :—Pentland Hills. *Sir. J. E. Smith.* Campsie! *Mr. Mc Kinlay.*

IRELAND :—Dunkerron. *Dr. Taylor.* Bantry. *Miss Hutchins.* Killarney. *Mr. Carroll.* near Tully! co. Galway. *Mr. Larbalestier.*

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

*f. clavata*, (Ach.) podetia white, subventricoso-cornute, sterile.

SYN :—Ach. Syn. 267. (1817).

EXS :—Schær. 75. Leight. 275! 297! 403!

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2...5...7, 8.

ENGLAND :—Leicestershire! *Rev. A. Bloxam.* Kynance Cove! Cornwall; Blackland Common, Henfield! Sussex. *Mr. Borrer.* Nesscliffe! Long Mynd! Wrekin! and Laurence Hills! Shropshire.

WALES :—Barmouth! Conway Falls!

*f. polydactyla*, Flk. podetia scyphiferous, scyphi digitato-cristate.

SYN :—Mudd Man. 62. (1861).

FIG :—E. Bot. t. 2437.

EXS :—Schær. 454. Leight. 274. Mudd 27, 28. Br. Clad. 77. 78.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...7, 8...10...12, 13...15 ..19...31.

ENGLAND :—Westmoreland! *Mrs. Stanger.* Burton Mill Pond! Amberley Wild Nook! Sussex. *Mr. Jenner.* Kynance Cove, Cornwall! *Mr. Borrer.* Yorkshire. *Mr. Mudd.* Leicestershire. *Rev. A. Bloxam.*

SCOTLAND :—Carr Hill! Linn of Dee! *Mr. W. Gardiner.* Loch Minch, Aberdeen! *Mr. Croall.* Kirkmichael, Dumfriesshire, *Mr. Mc Garroch.*

IRELAND :—Bantry! *Miss Hutchins.*

WALES :—Moel-y-Golfa! Montgomeryshire.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

*f. carcata*, Ach. podetia leafy and squamulose.

SYN :—Ach. L. U. 568. (1810). Syn. 266.

EXS :—Mudd Br. L. 23. Br. Clad. 72, 79.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...7 11, 12 . 15...19...31.

ENGLAND :—Westmoreland! *Mrs. Stanger.* West Allen Carrs, Northumberland. *Rev. W. Johnson.* Lyth Hill! Shropshire.

SCOTLAND :—Craig-y-Barns, Dunkeld! *Dr. Lindsay.*

IRELAND :—Killarney Hill. *Dr. Moore.*

WALES :—Moel-y-Golfa! Montgomeryshire.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

*f. ostreatiformis*, thalline leaves adscending and imbricate, rotundate, thickened and pulverulent at the margins, green above, white pulverulent beneath, podetia similar to those of *clavata*.

FIG :—Can E. Bot. t. 2112. be this?

EXS :—Leight. 371. Mudd Br. Clad. 69.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...10.

ENGLAND :—Yorkshire ! *Mr. Mudd.* Laurence Hill ! Shropshire.
Passing insensibly into *digitata*. Similar in general appearance to *C. bacillaris* but distinct by different reaction.

*f. coronata*, Ach. podetia cylindrical pulverulent and subsquamulose, branches digitato-radiate ; apothecia terminal, subglobose, red.

On the earth. 1877.

SYN:—Ach. Syn. 267.
FIG :—Dill. t. 15. f. 19. C.
IRELAND :—Near the Lake, Ballinahinch, Galway. *Mr. Larbalestier.* (1877).

*** *Reaction*, (*K*—*C*—)

19. *C. Florkeana*, Fr. thallus squamulose, evanescent ; podetia 1—1½ inch, white or brown, cylindrical, slender, cartilaginous, *glabrous, continuously corticate, verruculose* or *squamoso-decorticate, nigrescent at the base, scales and granules innate*, apex thickened, obsoletely scyphiferous and shortly divided ; apothecia conglomerate.

Mountainous heaths, rare.

SYN :—Fr. L. E. 238. (1831). Nyl. Syn. 225. Flk. Clad. 99 ; *Cladonia coccifera v. Florkeana*, Mudd Man. 61. (in part). Br. Clad. 33. (in part).
FIG :—Laur. in Sturm D. Fl. t. 14. f. a. d.
EXS :—T. M. Fr. Lich. Scand. 13. (in part).
GEOG. DISTRIB :—N. America, Australasia.
BOT. PROV :—3,...10...15...19, 20.
ENGLAND :—Yorkshire ! *Mr. G. Dickson.* Leith Hill, Surrey. *Mr. W. Joshua.*
SCOTLAND :—Ben-a-Bourd. *Mr. W. Gardiner.*
IRELAND :—Doneraile Mountains, co. Cork. *Mr. Carroll.* Killarney. *Dr. Carrington.*

Var.* *bacillaris*, Ach. similar to *Florkeana* in general characters, but the cortex deliquesces into a granular ashey-grey or a fine white impalpable powder, or the granules are developed into minute leafy scales, which more or less entirely cover the podetia.

Mountainous heaths, not unfrequent.

Hitherto confused by external aspect and characters alone with *C. macilenta*, but separated by different reaction. Analogous to *Florkeana*, as *pleurota* to *cornucopioides* and *fimbriata* to *pyxidata*.
SYN:—Var.* *bacillaris*, Ach. and auct. pro. max. p. ; Leight. in Ann. and Mag. N. H. Nov. 1866.
EXS :—Schær. 36. 37. 56. Mudd Br. L. 24. Br. Clad. 70. 71. 73.
GEOG. DISTRIB :—Europe, N. Tropical and S. America, India, Australasia.
BOT. PROV :—3...5...7, 8...10...15, 16.. 19...26...31.
ENGLAND :—Yorkshire ! *Mr. Mudd.* Leicestershire ! *Rev. A. Bloxam.* Basingstoke ! *Mr. R. S. Hill.* Long Mynd ! Stiperstones ! Wrekin ! Laurence ! Caradoc ! Abdon Burf ! Craigforda ! Shropshire.
SCOTLAND :—Aberdeen ! Ben-na-Bourd ! *Mr. Croall.* Sidlaw Hills ! and Cairn-a-Drochel ! *Mr. W. Gardiner.* Appin, Argyleshire. *Rev. J. M. Crombie.*
IRELAND :—Ireland ! *Miss Hutchins & Sir T. Gage.* near Kylemore and Letterfrack. *Mr. Larbalestier.*
WALES :—Barmouth !
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

20. *C. bellidiflora*, Schær. thallus folioso-squamaceous ; podetia *flavescent*, 1—2 inches, elongated, glabrous, cylindrical, *simple, verrucoso-scabrous* or *foliaceo-squamulose, scyphi narrow*, sometimes divided ; apothecia conglomerate.

Lofty mountains, very rare.

Distinct by reaction from *vestita* (K *f* + C + ) with which it has been hitherto confounded.

SYN :—Schær. Spicil. 21. (in part) Nyl. Syn. 221. (in part); *Scyphophorus bellidiflorus*, Hook. Brit. 240; *Cenomyce bellidiflora*, Hook. Scot. 64; Mack. Hib. 82; *Cladonia coccifera B. bellidiflora*, Mudd Man. 60. Br. Clad. 29. (in part).

FIG :—E. Bot. t. 1894.

EXS :—Schær. 42. Anzi Clad. Cis. 16 B!

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—1...7...11...14, 15, 16...23...30.

ENGLAND :—Lustleigh Cleve, Devon. *Mr. Parfitt*. Prestwick Carr; Hexham and Dilston Fells; Cheviot, Northumberland; Teesdale and Weardale, Durham. *Mr. Winch*. Swinnop and Top of West Allen Carrs, Northumberland. *Rev. W. Johnson*.

SCOTLAND :—Ben Nevis. *Messrs. Turner & Hooker*. Ben Lawers! Ben Lomond! Cairn Gorm! *Sir W. J. Hooker*. Craig Chailleach! *Mr. D. Turner*. Ben Ferrog! Ben Cruachan! *Mr. Borrer*. Arran. *Prof. Balfour*. Pentland Hills. *Dr. Greville*. Lochnagar! Aberdeen! Cawdor Wood! Nairn! and Braemar! *Mr. Croall*.

IRELAND :—Near Belfast. *Mr Templeton*. Kelly's Glen, Dublin. *Dr. Moore*.

WALES :—Diffwys, near Barmouth. *Rev. T. Salwey*.

### SUB-GENUS 3. CLADINA. *Nyl.*

Thallus leafless; podetia without scyphi, repeatedly branched, more or less smooth; apothecia terminal, biatorine, pale or red.

#### A. *Phæocarpæ, apothecia pale or fuscous.*

##### * *Reaction* (*K f* + *C* + ).

1. *C. sylvatica*, Hffm. podetia 2—6 inches high, *white or pale straw-coloured glabrous*, branched, *terminal branches radiato-cymose*, fastigiate, apices subsecund nodding.

Hills, mountains, heaths, &c., probably not uncommon.

Separated from *rangiferina* by the above characters and different reaction.

SYN :—*C. sylvatica*, Hffm. Fl. Germ. 114. (1795). Nyl. Syn. 212. *C. rangiferina B. sylvatica*, Mudd Man. 59. Br. Clad. 25.

EXS :—Coëm. Clad. Belg. 158. 159. Leight. 57.

GEOG. DISTRIB :—Europe, N. & S. America, India, Australasia.

BOT. PROV :—8...11, 12...14, 15...19...26.

ENGLAND :—Market Rasen! Lincolnshire. *Dr. F. A. Lees*. West Allen Carrs, Northumberland; Foreshield Fell, Cumberland. *Rev. W. Johnson*.

SCOTLAND :—Pentland Hills! *Dr. Greville*. Deerhill Wood! Sands of Barrie! *Mr. W. Gardiner*. Callander! *Mr. Mc Kinlay*.

IRELAND :—Killarney. *Dr. Carrington*. Kylemore! *Mr. Larbalestier*.

*f. scabrosa*, podetia scabrous, with minute whitish irregular points or verrucæ.

EXS :—Mudd Br. Clad. 57. 60.

In similar situations with type, but differences owing probably to age or climate.

ENGLAND :—Leicestershire! *Rev. A. Bloxam*. Basingstoke, Kent! *Mr. R. S. Hill*. Yorkshire! *Mr. J. G. Baker*. West Allen Carrs, Northumberland. *Rev. W. Johnson*. Long Mynd! Shomere Moss! Shropshire.

*f. alpestris*, Linn. podetia *white or pale straw-coloured*, verrucose, intricately and divaricately branched, *densely thyrsoid at the apex*.

Similar habitats with type; rare.

SYN :—f. *alpestris*, Linn. Sp. Pl. 1620. Nyl. Syn. 212; *Cladonia rangiferina v. alpestris*, Mudd Man.; Br. Clad.

FIG :—Dill. t. xvi. f. 29. E. F.

EXS :—M. & N. 1063!

GEOG. DISTRIB :—N. Tropical and S. America, Australasia.
BOT. PROV :—1...,15...23...26.
ENGLAND :—Near Exeter. *Mr. Parfitt.*
SCOTLAND :—Grampians. *Rev. J. M. Crombie.*
IRELAND :—Ballytore, Kildare! *Mr. Carroll.* Kylemore! *Mr. Larbalestier.*

*f. portentosa*, Duf. podetia very thick and turgid, *verrucoso-leprous*, branches short, *turgescent*, *apices denticulato-cristate.*

SYN :—Duf. Revis. 29. (1818). Nyl. Syn. 212.
EXS :—Coëm. Clad. Belg. 164. 165.
BOT. PROV :—8...11, 12.
ENGLAND :—Leicestershire! *Rev. A. Bloxam.* West Allen Carrs, Northumberland; Foreshield Fell, Cumberland. *Rev. W. Johnson.*

*f. pumila*, Ach. densely cæspitoso-pulvinular.

SYN :—Ach. L. U. 566. (1810). Syn. 278.
GEOG. DISTRIB :—N. and S. America, Africa, Polynesia, Australasia.
ENGLAND :—Leicestershire! *Rev. A. Bloxam.* Nesscliffe, Shropshire!

2. *C. amaurocræa*, (Flk.) *straw-coloured* or whitish-straw-coloured, efoliolose; *podetia glabrous* or slightly squamoso-decorticate, *straight*, *subulate* and slender, much branched, some scyphiferous, *scyphi cupuliform*, *dentato-cristate* or subulato-spinose, often proliferous.

In sub-alpine regions, very rare. 1869.

SYN :—Flk. Clad. 119. (1828). Nyl. Syn. 216. Crombie En. 22.
EXS :—Fellm. 41. Fries 347.
GEOG. DISTRIB :—Northernmost parts of Europe, Asia, America, and Australasia.
BOT. PROV :—15...26.
SCOTLAND :—County of Aberdeen. *Rev. J. M. Crombie.* (1869).
IRELAND :—Road to Recess, in bogs, 5 miles from Kylemore. *Mr. Larbalestier.*

** *Reaction*, (*K*+*C*—).

3. *C. rangiferina*, Hffm. podetia 2—6 inches high, *cinerascent*, *verruculoso-scabrous*, *subtomentose*, branched, terminal branches *subcorymbose*, fastigiate, apices subsecund, nodding.

Hills, mountains, heaths, common.

Distinguished from *sylvatica* by the above characters and different reaction.
SYN :—*C. rangiferina*, Hoffm. Fl. Germ. 114. (1795). Nyl. Syn. 211; Hook. Brit. 235; Mudd Man. a. 58. Br. Clad. a. b. c. 25; *Cenomyce rangiferina*, Hook. Scot. 65. Mack. Hib. 79.
FIG :—E. Bot. t. 173. Dill. xvi. f. 29. A. B.
EXS :—Schær. 76. (f. gracilis), 77. (f. grandis,) Coëm. Clad. Belg. 140. 146.
GEOG. DISTRIB :—Europe, N. and S. America, Asia, Africa, India.
BOT. PROV :—1, 2...4...10...13, 14, 15, 16...18...31.
ENGLAND :—Yorkshire! *Mr. Mudd.* Dartmoor. *Mr. Parfitt.* Peart's Crags; near Park House, Settle, Yorkshire. *Dr. Windsor.* Bedfordshire. *Rev. C. Abbot.* Tiptree Heath, Essex, *Mr. Varenne.* near Hastings, Sussex. *Rev. E. N. Bloomfield.* Shropshire!
SCOTLAND :—Sands of Barrie! Summit of Lion's Face! *Mr. W. Gardiner.* Glen Callater! Braemar! *Dr. Lindsay.* Craig Koynoch! *Mr. Croall.* Hebrides; Arran; Long Island. *Prof. Balfour.* Hartfell, Moffat. *Dr. Nichol.* Pentland Hills. *Dr. Greville.*
IRELAND :—On heaths and mountains, common. *Mr. Carroll.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey; Sark; Herm; Jethou, &c. *Mr. Larbalestier.*

*** *Reaction*, (*K*—*C*+).

4. *C. uncialis*, Hffm. podetia *greenish-straw-coloured*, *glabrous*, cylindrical, *fistulose*, dichotomous, branches short, *apices subulate denticulate or digitate.*

Heaths and moors, common.

SYN :—*C. uncialis*, Hffm. Fl. Germ. 117. (1795). Nyl. Syn. 215, Hook. Brit. 235; Mudd Man. 59; *Cenomyce uncialis*, Hook. Scot. 64. Mack. Hib. 79. *Cladonia stellata a. uncialis*, Mudd Brit. Clad.
FIG :—E. Bot. t. 174.
EXS :—Schær. 82. Leight. 58.
GEOG DISTRIB :—Europe, N. America.
BOT. PROV :—1...4, 5...7, 8...10, 11...15, 16...18...20...26.
ENGLAND :—Yarmouth! *Mr. D. Turner*. Leicestershire. *Rev. A. Bloxam*. Dartmoor. *Mr. Parfitt*. Malham Tarn, near Settle. *Dr. Windsor*. Ampthill, Beds. *Rev. C. Abbot*. Northumberland and Durham. *Mr. Winch*. Bromsgrove Lickey, Worcestershire. *Mr. Purton*. Hightor Down; Woodbury Hill, Devon. *Messrs. Jones & Kingston*. West Allen Carrs, Northumberland. *Rev. W. Johnson*. Shropshire!
SCOTLAND :—Ben Mc Dhiu, Braemar! *Dr. Lindsay*. Hartfell, Moffat. *Dr. Nichol*. Hebrides; Arran. *Prof. Balfour*.
IRELAND :—Coachford! co. Cork. *Mr. Carroll*. Kylemore. *Mr. Larbalestier*.
WALES :—Llyn-y-Cwm Bychan! near Barmouth. *Mr. Borrer*. Capel Curig! Llyn-y-Cwn! Berwyn Mountains! near Pistil Rhaiadr.

*f. turgescens*, Fr. podetia thickened and turgid upwards, apices dilated, denticulato-stellate.

Heaths and mountains, rare.

SYN :—*C. turgescens*, Fries L. E. 244 (1831). Mudd Man. 59; *Cladonia stellata b. turgescens*, Mudd Man. Clad. 27.
EXS :—Schær. 84.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5...15...26.
ENGLAND :—Hants! *Mr. R. S. Hill*.
SCOTLAND :—Ben Lawers; Ben Voirlich, *Dr. Greville*. Hill of Ardo, near Aberdeen! *Rev. J. M. Crombie*.
IRELAND :—Kylemore! *Mr. Larbalestier*.
WALES :—Cwm Idwal!

*f. obtusata*, Ach. podetia aggregate, short, turgid, ramulose, branches excessively short, subincrassate obtuse and with black denticulations at the apex.

Bogs, very rare. 1876.

SYN :—Ach. L. U. 559. (1810). Syn. 265.
IRELAND :—Bogs near Kylemore. *Mr. Larbalestier*. (1876).

*f. adunca*, (Ach.) podetia elongated, somewhat turgid, branches hooked.

Similar situations with type, not uncommon.

SYN :—f. *adunca* (Ach.) Hook. Scot. 64; *Cladonia stellata B. elatior*, Mudd Man. 59! *Cladonia stellata B. adunca*, Mudd Br. Clad. 26!
FIG :—Dill. XVI. f. 21. A.B.
EXS :—Schær. 513. 514. Mudd L. Br. 21! Br. Clad. 62!
GEOG. DISTRIB :—Europe.
BOT. PROV. :—2...10, 11...15...20.
ENGLAND :—Hants! *Mr. R. S. Hill*. Yorkshire! *Mr. Dixon*. Cheviot! Teesdale. *Mr. Winch*.
SCOTLAND :—Ben Nevis! *Dr. Lindsay*. Summit of Bassier, Clova! Sidlaw Hills! Forfar. *Mr. W. Gardiner*.
Dr. Taylor in Mack. Hib. 79. mentions a var. *attenuata* gathered by Mr. Templeton on the side of Devis Mountains, to which he quotes Dill. xvi. f. 22 H. and thus characterizes; thallus of minute lobed basal scales; podetia brown, subdivided at the summits, beset with minute scales. Whatever this may prove on inspection of the specimens, it certainly does not belong to this sub-genus *Cladina*.

## II. PILOPHORON. *Tuck.*

Thallus subsquamaceo-granulose. Podetium rigid, cylindrical, simple, or branched upwards, granulate. Apothecia nigro-rufous, capituliform, subglobose, internally solid. Spores 8, colourless, ellipsoid, or oblongo-ellipsoid, simple. Sterigmata simple. Spermatia cylindrical, curved or straight.

1. *P. fibula*, Tuck. whitish, subsquamaceo-granulate, concrescenti-areolate, appressed; podetia solid, erect, terete, very short, simple, subsquamaceo-granulate; apothecia subglobose, depressed; spores 8, colourless, ellipsoid, or ellipsoideo-fusiform; cephalodia thalline, fusco-nigricant, minutely tuberculose.

On perpendicular wet rocks, rare.

SYN:—*P. fibula*, Tuck. Syn. Lich. N. Amer. p. 46. (1845). Nyl. Syn. 229.
FIG:—Th. M. Fries Mon. Ster. & Pil. t. 10. f. 5. Nyl. Syn. t. 7. f. 6.
GEOG. DISTRIB:—N. America, Lapland, Norway, Sweden, Finland.
BOT. PROV:—5...7...16...26.
SCOTLAND:—Morrone, Ben Cruachan. *Rev. J. M. Crombie*, near Cuchullin Hills, near Sligachan, Isle of Skye! *Mr. Piggot.*
IRELAND:—Kylemore Castle! Salrock Road! co. Galway! *Mr. Larbalestier.*
WALES:—Llyn Cae! Llyn Aran! and the Giant's Pebbles! Cader Idris! Arran Mowddy! Pass of Llanberis! Snowdon! Cwm Cywion! Cwm Ffynnon Lloer! Cwm Clwyd! Capel Curig!
"Spores .017—20 mm. long, .006—8 mm. broad." *(Nyl.)*

A single specimen of another species, named by Dr. Nylander in a letter to Rev. J. M. Crombie, 1875, and noted by the latter in Journ. Bot. May, 1875, as *P. strumaticum*, Nyl. was collected by Mr. Crombie on micaceo-schistose rocks at Morrone, Braemar, in 1869. But no diagnosis of this excessively rare species nova has as yet been published, therefore I am ignorant of its peculiar characteristics, particularly as I have seen no specimen.

## TRIBE V. STEREOCAULEI.

Thallus generally cæspitose, formed of podetia with a solid cartilaginous medullary axis, around which the white exterior fragile granulose portions of the thallus are congregated. Apothecia terminal or lateral, lecideine, nigricant or fuscous.

## I. STEREOCAULON. *Schreb.*

Podetia covered with fragile granules of various forms. Apothecia fuscous or fusco-pallescent, internally solid. Spores cylindraceo-fusiform, with few or many septa, (3—9). Sterigmata simple. Spermatia aciculari-bacillar, straight, or slightly curved.

1. *S. coralloides*, Fr. cæspitose, ramose, *glabrous*, granules cinerascent, *subfibrillose or digitato-divided;* apothecia terminal and lateral; spores cylindraceo-fusiform, 3-septate; cephalodia cinerascent, verrucose, minutely granulate, sessile.

On rocks, common.

SYN:—*S. coralloides*, Fr. Sched. Crit. 4. p. 24. (1824). Nyl. Scand. 63. Syn. 241. Mudd Man. 65.
FIG:—Nyl. Syn. t. 7. f. 16. Schær. En. t. 6. f. 5.

Exs:—Tuck. 94. Schær. 261. Hepp 114. M. & N. 73. Leight. 148. Mass. 44. Anzi It. S. 28. Rabh. 939.

Geog. Distrib:—N. Europe, N. Asia, N. America.

Bot. Prov:—1...7...10, 11...13, 14, 15, 16...19...26.

England:—Teesdale, Durham. *Rev. J. Harriman.* Baysdale Moor! Cleveland. *Mr. Mudd.* Dartmoor. *Dr. Holl.* West Allen Carrs, Northumberland. *Rev. W. Johnson.*

Scotland:—Caerlaverock Wood! Dumfries; Isle of Skye. *Dr. Lindsay.* Pentland Hills. *Dr. Greville.* Sidlaw Hills; Balgay; Clova; Canlochen. *Mr. W. Gardiner.* Grampians. *Rev. J. M. Crombie.* Ben Lawers. *Dr. Holl.*

Ireland:—Killarney. *Dr. Carrington.* Conner Cliffs, near Dingle; on Caher McGillicuddy's Reeks; Blackwater Bridge, Kerry. *Mr. Carroll.* Mountains of Maam. *Mr. Larbalestier.*

Wales:—Cader Idris. *Dr. Holl.* Pen-y-gwryd. *Mr. W. Joshua.* Barmouth! Capel Curig! Cwm Cywion! Aran Mowddy!

"Spores .006 to .008 in. long, by .0005 to .00075 in. broad." (*Mudd*). "Spores .020—38 mm. long, .003—5 mm. broad." *(Nyl).* "Spores .022—40 mm. long, .0025—40 mm. broad." *(T. M. Fr.)*

2. *S. paschale*, Ach. *densely stipate, ascending, nearly glabrous,* granules albo-cinerascent or *whitish, crenate;* apothecia terminal; spores fusiformi-cylindrical, 3 (sometimes 5—9)-septate; cephalodia verrucose, cinerascent, sessile.

On rocks, common. 1724.

Syn:—*S. paschale*, Ach. Meth. 315. (1803). Nyl. Scan. 64. Syn. 242. Mudd Man. 65.

Fig:—E. Bot. 282. Nyl. Syn. t. 7. f. 18—28.

Exs:—Tuck. 112. Hepp 304. Reich. & Schub. 142. Leight. 148.

Geog. Distrib:—Europe, Asia. N. America, Ceylon.

Bot. Prov:—1, 2...5...7, 8...10, 11, 12, 13, 14, 15...18, 19...26

England:—Cumberland! *Mrs. Stanger.* Oswestry! Shropshire. *Rev. T. Salwey.* Yorkshire. *Mr. Dixon.* Teesdale. *Sir W. C. Trevelyan.* Kielder, Northumberland. *Prof. Balfour.* Sussex. *Mr. Hemmings.* Falcon Clints, Teesdale. *Mr. Mudd.* between Lostwithiel and St. Austell, Cornwall. *Messrs. Turner & Sowerby.* near Ambleside. *Sir J. E. Smith.* Dartmoor, Devon. *Mr. Newberry.* Northumberland and Durham. *Mr. Winch.* Blackstone Rock, Devon. *Mr. Parfitt.* Black Edge, near Buxton. *Dr. Holl.* Pophills, near Alcester. *Mr. Purton.* Abdon Burf! Shropshire.

Scotland:—Hill east of Glen Callater! Braemar; Caerlaverock, Dumfries; and opposite Birnam, Dunkeld. *Dr. Lindsay.* Inchnadaff, Berwickshire. *Sir W. C. Trevelyan.* Strathmartin, Forfarshire. *Mr. W. Gardiner.* Callernish, Lewis. *Dr. Lindsay.*

Ireland:—Connemara! co. Galway. *Dr. Moore.* Killarney. *Dr. Carrington.* Conner Cliff, Dingle. *Mr. Carroll.* Tullywee Bridge! near Lough Inagh! co. Galway. *Mr. Larbalestier.*

Wales:—Cader Idris and Snowdon. *Dillenius.* Craig Breiddin! Montgomeryshire! Trefriw!

"Spores .005 to .009 in. long, by .0005 to .00075 in. broad." (*Mudd.*) "Spores .018—40 mm. long, .0035—.45 mm. broad." (*Nyl.*) "Spores .024—39 mm. long, .003—4 mm. broad." (*T. M. Fr.*)

3. *S. tomentosum*, Fr. podetia *densely arachnoideo-tomentose, whitish, divaricato-ramose,* granules *albido-cinerascent, crowded, rounded or crenate;* apothecia terminal and lateral; spores fusiformi-bacillar, 3,-(rarely 5—7)-septate.

On rocks, rare.

Syn:—*S. tomentosum*, Fr. Sched. Crit. 3. p. 20. (1824). Nyl. Scand. 64. Nyl. Syn. 243. Mudd Man. 65.

Exs:—Tuck. 23. Schær. 262. Hepp 302. Anzi Ven. 19.

Geog. Distrib:—Europe, Asia, Peru, N. & S. America.

Bot. Prov:—10...12...15.

England:—Yorkshire. *Mr. Dixon.* Foreshield, Alston, Cumberland. *Rev. W. Johnson.*

SCOTLAND :—South Ferry Links, Fifeshire ! *Dr. Ogilvie.* Sands of Barrie ; Head of Canlochen, Forfarshire. *Mr. W. Gardiner.* Ben Lawers ! *Dr. Lindsay.* Grampians. *Rev. J. M. Crombie.*

"Spores .006—.008 in. long. by .0005 to 00075 in. broad." *(Mudd.)* "Spores .023—37 mm. long, .0025—.0045 mm. broad." (*Nyl.*) "Spores .022—37 mm. long, .002—3 mm. broad." (*T. M. Fr.*)

Var. *alpinum*, Laur. podetia less tomentose, granules whitish, turgid, verrucoso-conglomerate.

On rocks.

SYN :—*S. alpinum*, Laur. Fr. L. E. p. 204. (1831). Nyl. Scand. 64. Syn. 244. Mudd Man. 66.
EXS: —Schær. 263. Hepp 303.
GEOG. DISTRIB :—Europe, Asia.
BOT. PROV :—12...15...26.
ENGLAND :—Cumberland ! *Mrs. Stanger.*
SCOTLAND :—Ben Lawers. *Dr. Holl.* Braemar. *Adm. Jones.*
IRELAND :—Connemara. *Dr. Moore.* near Glencorbol ! *Mr. Larbalestier.*

Var. *botryosum*, Nyl. podetia glabrous, granules thyrsoideo-conglomerate on the extremities of the branches.

On rocks.

SYN :—Nyl. Scand. 64.
EXS :—Schær. 264.
GEOG. DISTRIB :—Switzerland, Scandinavia.
BOT. PROV :—10.
ENGLAND :—Teesdale. *Mr. Mudd.*

4. *S. denudatum*, Flk. podetia *slender*, simple or branched, *attenuate at the apex*, *glabrous*, granules whitish, or albo-cinerascent, *subpeltate*, *medio-depressed*, the centre virescent, *margin white crenulate ;* apothecia fuscous, small, plane or convex, terminal or lateral ; spores elongato-fusiform, 3-(rarely 5—7)-septate ; cephalodia olivaceo-fuscescent, verrucoso-glomerulose.

On rocks, not uncommon.

SYN :—*S. denudatum*, Flk. D. L. 79. (1815). Nyl. Scand. 65. Syn. 247. Mudd Man. 66.
FIG :—Nyl. Syn. t. 7. f. 29.
EXS :—M. & N. 466. Fr. 346. Anzi Langob. 15. Smrft. 163.
GEOG. DISTRIB :—Europe, Asia, America.
BOT. PROV :—1...5...7...10, 11...15...18, 19, 20...26...30.
ENGLAND :—Dartmoor. *Dr. Holl*, Battersby Moor ! Yorkshire. *Mr Mudd.* Teesdale, Durham. *Mr. Baker.* Clee Hill ; Mynydd-y-Myfyr, Shropshire. *Rev. T. Salwey.*
SCOTLAND :—Aumbre ! Perthshire ; Caerlaverock Wood ! Dumfries ; Ben Mac Dhiu, Braemar ! (4294 ft.) ; Ben Nevis ! *Dr. Lindsay.* Ben Lawers ! (4406. ft.) ; *Dr. Gilchrist.* Sidlaw Hills and Clova. *Mr. W. Gardiner.* Long Island. *Prof. Balfour.* Grampians. *Rev. J. M. Crombie.*
IRELAND :—Connemara ! and co. Antrim ; Killarney. *Dr. Moore.* Gongaumbarra, Cork. *Mr. Carroll.* Kylemore Castle ! Salrock Road ! co. Galway. *Mr. Larbalestier.*
WALES :—Pen-y-gwryd. *Mr. W. Joshua.* Llyn Aran ! Llyn Cae ! Cader Idris ! Arran Mowddy ! Pass of Llanberis ! Snowdon ! Cwm Idwal !

"Spores .005 to .008 in. long, by .0005 to .00075 in. broad." (*Mudd.*) "Spores .026—46 mm long, .003—4 mm. broad." (*Nyl.*) "Spores .021—40 mm. long, .002—4 mm. broad." *(T. M. Fr.)*

5. *S. condensatum*, Hffm. *very small*, podetia very short, strong, simple, naked, granules whitish or cinerascent, nodulose, crenulate, *condensed into a lax-granulose crust ;* apothecia fuscous, sessile ; spores fusiform or cylindraceo-fusiform, 3—7 septate.

On the earth and rocks, rare.

SYN :—*S. condensatum*, Hoffm. Fl. Germ. p. 130 (1795). Nyl. Scand. 65. Syn. 249 Mudd Man. 66.
FIG :—Nyl. Syn. t. 7. f. 31.
EXS :—Schær. 509. Mudd 33. Anzi It. S. 29. Mass. 181. Th. Fr. 64. Reich. and Schub. 68.
GEOG. DISTRIB:—Europe, N. America, Java.
BOT. PROV:—1...5...7...10, 11...15...19.
ENGLAND :—Battersby Moor ; ! Ayton Moor ! Cleveland. *Mr. Mudd.* Sweeney ! Shropshire. *Rev. T. Salwey.* Teesdale, Durham. *Rev. J. Harriman*, Budleigh Salterton, Devon. *Dr. Dickie.* Abdon Burf ! Shropshire.
SCOTLAND :—Amubree ! Perthshire. *Dr. Lindsay.* Auchterhouse and Balkernnock, Forfarshire. *Mr. Gardiner.* Castleton, Braemar. *Adm. Jones.*
IRELAND :—Mangerton, Killarney. *Mr. Carroll.*
WALES :—Moel-y-Golfa ! Montgomeryshire. Cwm Bochlwyd ! Crib Coch ! Snowdon. Cader Idris !
CHANNEL ISLANDS :—La Moie, Jersey ; Tortavel, Guernsey. *Mr. Larbalestier.*
"Spores .005 to .007 in. long, by .0005 to .00075 in. broad." (*Mudd.*) "Spores .028—36 mm. long, .003—.4 mm. broad." (*Nyl.*) "Spores .020—36 mm. long, .0015—25 mm. broad." (*T. M. Fr.*)

Var. *cereolinum*, Ach. thallus closely affixed to the rock ; podetia slender, glabrous, often sorediiferous at the apices ; cephalodia verrucoso-glomerulose, darkly cinereo-fuscescent.

On rocks, rare.

SYN :—*S. cereolinum*, Ach. Syn. 285. (1817). Nyl. Scand. 66. Syn. 250. Mudd Man. 67.
FIG :—E. Bot. Suppl. 2667.
EXS :—M. & N. 947. Anzi It. S. 30. Korb. 271.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—7...11...15...19...26...30.
ENGLAND :—near Eglestone, Durham. *Rev. J. Harriman.* Walltown ; Housesteads, Northumberland. *Mr. Winch.*
SCOTLAND :—Ben Nevis. *Adm. Jones.* Ben Lomond. *Mr. Cotton.* Ben Cruachan ; Ben Nevis ; Morrone. *Rev. J. M. Crombie.* Ben Lawers. *Dr. Holl.*
IRELAND :—Dunkerron ! *Dr. Taylor.* near Giant's Causeway. *Dr. Moore.* Kylemore ! co. Galway. Maam ! Joyce County ; Recess ! Connemara. *Mr. Larbalestier.*
WALES :—Llyn Aran ! near Llyn Gwernon ! Cader Idris.
"Spores .003 to .004 in. long, by .001 to .00125 in. broad." (*Mudd.*) "Spores .020—38 mm. long, .004—5. mm. broad." (*Nyl.*)

Var. *condyloideum*, (Ach.) thallus smaller, podetia slender, simple or branched, branches shortly ramuloso-divided at the apices.

On rocks, rare.

SYN :—Ach. Meth. Suppl. 51. (1803). Nyl. Scand. 66. Syn. 251. Crombie En. 17.
EXS :—Leight. 295.
GEOG. DISTRIB :—Sweden, Finland.
BOT. PROV :—10, 11, 12...15.
ENGLAND :—Housesteads, Northumberland. *Mr. Winch.* North West, Durham. *Mr. Thornhill.* Baysdale Moor ! Cleveland. *Mr. Mudd.* Foreshield Wood, Alston, Cumberland. *Rev. W. Johnson.*
SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie.*
"Spores .015—30 mm. long, .0025—35 mm. broad." (*Nyl.*)

*S. evolutum*, Græwe. densely cæspitose, glabrous, very much branched upwards, *granules cinereo-glaucous or whitish, crowded, ramuloso-divided, plano-compressed ;* apothecia terminal, large, margined, at length convexo-difformed ; *spores* firm, *oblong or oblongo-fusiform*, obtuse, 3-*septate.*

On granite boulders, rare. 1870.

SYN :—Græwe in Bot. Notiser. 1865. p. 181. T. M. Fr. Lich. Scand. 45.
EXS :—Rabh. 858.
GEOG. DISTRIB:—Sweden, Finland.

BOT. PROV :—7...16...26.
SCOTLAND :—Barcaldine, Argyleshire. *Rev. J. M. Crombie.*
IRELAND :—Letterfrack, Connemara ! *Mr. Larbalestier.*
WALES :—Nant Gwynant, Snowdon ! (1870.)
"Spores .016—20 mm. long, .005—6 mm. broad." *(T. M. Fr.)*

6. *S. nanum*, Ach. very small, flocculoso-pulverulent ; podetia *slender*, cæspitoso-congested, simple or branched upwards, branches *subfastigiate, obsoletely arachnoid, granules albido-glaucescent or subæruginose, minute, nodulose* or *powdery ;* apothecia unknown.

On earth and fissures of rocks, rare.

SYN :—*S. nanum.* Ach. Meth. 315. (1803). Nyl. Scand. 66.
FIG :—Micheli Nov. Gen. t. 53. f. 8.
EXS :—M. & N. 647. Hepp 547. Th. Fr. 37. Mass. 142. Schær. 588.
GEOG. DISTRIB :—Europe, Algeria, America.
BOT. PROV :—1...5...7...10...15...30.
ENGLAND :—Lamorna ! *Rev. T. Salwey.* Worcestershire Beacon, Malvern Hills ! *Mr. Lees.* Yorkshire ! *Mr. Dixon.* Sweeney, near Oswestry, Shropshire. *Rev. T. Salwey.* Teesdale Forest. *Rev. J. Harriman.* Cornwall. *Adm. Jones.* Devonshire. *Rev. J. M. Crombie.* near Exeter. *Mr. Parfitt.* Llanymynech ! Longmynd ! Shropshire.
SCOTLAND :—Den of Balthayock ! Perthshire. *Dr. Ogilvie.* West Water ! Forfarshire ; North banks of the Isla, West of the Reeky Lin, Forfarshire. *Mr. W. Gardiner.* Stenton Crag, Dunkeld. *Dr. Lindsay.* Grampians, Breadalbane and Braemar. *Rev. J. M. Crombie.* Glen Lochy, near Killin, Perthshire. *Dr. Holl.*
IRELAND :—Learmont, co. Derry. *Adm. Jones.*
WALES :—Gwydir Woods, Bettws-y-coed ! Towyn ! Aberdovey !
Confer. Nyl. Obs. in Flora 1876 p. 578.

## SERIES III. RAMALODEI.

Thallus fruticulose or filamentose, erect or pendulous, terete, or variously compressed or angular, without any leaflets or granular or basal crust, internally tubulose with a hollow medulla, or solid. Apothecia generally lecanorine.

### TRIBE VI. ROCCELLEI.

Thallus ramose, terete or compressed, whitish, sub-cartilaginous internally with a copious filamentose medulla. Apothecia adnate, nigricant. Spores oblongo-fusiform, 3-septate.

### I. ROCCELLA. *DC.*

Thallus fruticulose, terete or compressed, albicant, or cinereo-lurid, opake, smooth, internally dense. Apothecia lateral, lecideine, lecanorine or irregular, hypothecium thick, black. Spores oblong or fusiform, 3-septate, straight or curved. Spermatia acicular, arcuate.

1. *R. tinctoria*, DC. terete or sub-compressed, whitish, *vermiculari-elongate, simple or bifurcate ;* apothecia lecideine, black, albido-pruinose ; *spores oblongo-fusiform*, 3-septate (C red.)

On rocks by seaside.

SYN :—*R. tinctoria*, DC. Fl. Fr. 2. 334. (1805). Nyl. Syn. 258. Mudd Man. 75.
FIG :—E. Bot. 211. Nyl. Syn. t. 1. f. 2. Tul. Mem. Lich. t. 16 f. 6. 7.
EXS :—Schær. 602. Mass. 124. Anzi Etr. 4. Hepp 568
GEOG. DISTRIB :—Europe, Africa, E. Indies, Central America.
BOT. PROV :—1, 2...31.

ENGLAND :—Portland Islands. *Viscount Lewisham.* Lynmouth Tors. *Miss Atwood.* Devon. *Rev. J. M. Crombie.*

CHANNEL ISLANDS :—Guernsey. *Mr. Gosselin.* St. Ouen's Bay, Jersey. *Mr. W. Stevens.* Scilly Islands. *Sir W. J. Hooker.*

"Spores .005 in. long, by .001 in. broad." *(Mudd.)* "Spores .014—22 mm. long, .004—6 mm. broad." (*Nyl.*)

2. *R. phycopsis*, Ach. terete or slightly compressed, whitish, or *much branched and densely cæspitose ;* apothecia lecideine, black, naked or pruinose ; spores *fusiformi-oblong*, 3-septate, (C red but soredia—).

On maritime rocks.

SYN :—*R. phycopsis*, Ach. L. U. 440. (1810). Nyl. Syn. 259 Mudd Man. 75.

FIG .—Schær. Enum. t. 1. f. 3. Nyl. Syn. t. 8. f. 3. Tul. Mem. L. t. 16. f. 1. 5. 8.

EXS :—Mudd 48. Larb. 11. Mass. 208. Anzi It. S. 25. Hepp 357.

GEOG. DISTRIB :—Europe, Africa.

BOT. PROV :—1, 2...31.

ENGLAND :—Bembridge ! Isle of Wight ; Walls of Godshill Church, Isle of Wight ! *Mr. A. G. More.* Coasts of Devon and Cornwall ; Portland Island. *Rev. J. M. Crombie*, Scilly Islands. *Sir W. J. Hooker.* Bolt Head, S. Devon. *Dr. Holl.*

CHANNEL ISLANDS :—St. Brelade Bay ; Noirmont ; Jersey ! Jervonsey, Guernsey ; Sark. *Mr. Larbalestier.* Scilly Islands. *Rev. J. M. Crombie.* Guernsey. *Rev. T. Salwey.*

"Spores .012—16 mm. long, .003—4 mm. broad." *(Nyl.)*

Forma *tenuior*, Larb. very slender, branched at the apices, subterete.

CHANNEL ISLANDS :—La Moye, Jersey ! *Mr. Larbalestier.* (1873).

3. *R. fuciformis*, Ach. compressed, whitish, albido-glaucescent or glauco-fuscescent, *polished, fuciformi-branched, rigid ;* apothecia marginal, *lecanorine or dirinoid*, superficial, pruinose ; spores fusiform or oblongo-fusiform, 3-septate ; *(C—but soredia red.)*

On maritime rocks.

SYN :—*R. fuciformis*, Ach. L. U. 440. (1810). Nyl. Syn. 260. Mudd Man. 76.

FIG :—E. Bot. 728. Nyl. Syn. t. 8. f. 5.

EXS :—Bourg. 277. Larb. 12. Mandon. 23. Hepp 567. Schær. 553. Mass. 286. Leight. 171.

GEOG. DISTRIB :—Europe, Africa, Centra America.

BOT. PROV :—1...31.

ENGLAND :—Tintagel, near Arthur's Castle. *Mr. D. Turner.* Coast of Devon. *Rev. J. M. Crombie.* Bolt Head, S. Devon. *Dr. Holl.*

CHANNEL ISLANDS :—Guernsey. *Mr. Dickson.* Beauport Bay ; Noirmont, Jersey ! *Mr. Larbalestier.* St. Brelade Bay, Jersey. *Mr. W. Stevens.* Scilly Islands. *Sir W. J. Hooker.*

"Spores .005 to .006 in. long, by .001 in. broad," (*Mudd*). "Spores .020—30 mm. long, .004—6 mm. broad." *(Nyl.)*

## TRIBE VII. SIPHULEI.

Thallus podetiiform, whitish, opake, fistulose. Apothecia unknown.

### I. THAMNOLIA. *Ach.*

Thallus consisting of stipites or podetia which are cylindrical or sub-compressed, cornute, imperforate, simple or branched, apices acute, internally fistulose. Apothecia unknown. Spermatia cylindrical.

1. *T. vermicularis*, Sw. chalky-white, 2-4 inches, prostrate, ascending or erect, subulate or turgid, simple or bifurcate, smooth or longitudinally rugulose, dispersed or stipate. (K +).

On mossy earth, rare. 1799.

SYN:—*Lichen vermicularis*, Sw. in Linn. fil. Meth. Musc. 119. (1781). Nyl. Syn. 264. Mudd Man. 68.
FIG :—E. Bot. 2029. Hoffm. Pl Lich. t. 29. f. 1. 2 3. Nyl. Syn. t. 8. f. 6.
EXS :—Schær. 86. Tuck. 118. Hepp 298. Anzi Cisalp. 28. Fellm. 48.
GEOG. DISTRIB :—Europe, Asia, Central and S. America, New Holland.
BOT. PROV :—7...12 ..15, 16.
ENGLAND :—Skiddaw, Cumberland. *Mr. Pilkington.*
SCOTLAND :—Scotch Mountains. *Mr. Dixon.* (1799). Ben Lawers! Ben Nevis. *Mr. D. Turner.* Forfarshire. *Mr. W. Gardiner.* Summit of Lochnagar! Braemar. *Dr. Lindsay.* Peak of Mamsoul, Inverness. *Dr. B. White.* Grampians. *Rev. J. M. Crombie.*
WALES :—Cader Idris. *Rev. T. Salwey.*

## TRIBE VIII. USNEEI.

Thallus whitish or pallido-virescent, fruticulose, ramose and ramulose, tough, terete, erect or pendulous, corticate on all sides, internally with a firm filiform cartilaginous axis, affixed by a more or less spreading point or base. Apothecia lecanorine, peltate, thalline margin ramuloso-ciliate. Spores colourless, small, ellipsoid. Paraphyses indistinct.

### I. USNEA. *Dill. Ach.*

Thallus fruticulose, filamentose, erect or pendulous, fibrilloso-ramulose, medullary axis solid. Apothecia concolorous orbicular, or peltate, terminal or lateral. Spores small, ellipsoid, colourless, simple. Sterigmata simple. Spermatia straight, cylindrico-acicular, apically truncate, fusiformi-turgid basally.

1. *U. barbata*, (L.) Fr. albido-glaucescent or pale cinereo-virescent, terete, variously branched, erect or pendulous ; apothecia concolorous, rather large, fibrilloso-radiate ; spores shortly ellipsoid, simple.

On trees, pales, &c. common. 1778.

f. 1. *florida*, (L.) Fr. *erect, scabrid, divergenti-ramose ; apothecia large*, plane, pallido-carneous, *pruinose*, with long ciliæ at the margin.

SYN :—Fries L. E. 18. Nyl. Scand. 68. Mudd Man. 69 T. M. Fr. Scand. 15. Nyl. Syn. 267. Linn. Sp. Pl. ed. 1. p. 1156. (1753).
FIG :—E. Bot. 872. Hoffm. Pl. Lich. t. 30. f. 2. Mudd Man. t. 1. f. 15.
GEOG. DISTRIB :—Throughout the Word.
BOT. PROV :—1, 2...5...7...10, 11, 12...14, 15 26...30.
EXS :—Anzi It. S. 12. Mass. 51. M. & N. 260. Schær. 398. Hepp 826. Bohl. 128. Spruce 48. 54. Mudd 34. Welw. Lus. 115. Reich. & Schub. 92.
GEOG. DISTRIB :—Europe, Asia, Africa, America, Australasia.
BOT. PROV :—1...5, 6...10, 11...14, 15...30, 31.
ENGLAND :—Near Ludlow, Shropshire! *Rev. T. Salwey.* Ayton Moor! Cleveland. *Mr. Mudd.* Gibside Woods, Durham. *Mr. Winch.* Wetheley; Ragley Park, Worcestershire *Mr. Purton.* Haldon, Devon. *Mr. Parfitt.* New Forest; near Exeter and Hastings. *Rev. J. M. Crombie.* Foreshield Wood, Alston, Cumberland; Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Ryde, Isle of Wight. *Rev. A. Bloxam.*
SCOTLAND :—Swanston Wood, Edinburgh. *Dr. Greville.* Deerhill Wood, Forfarshire. *Mr. W. Gardiner.* Kinnoul Wood. *Mr. Croall.* Kinnaird. *Mr. J. Laing.* Killin, Braemar. *Rev. J. M. Crombie.*

IRELAND :—Near Belfast. *Mr. Templeton.* various places, co. Galway. *Mr. Larbalestier.*
WALES :—Hafod, Cardiganshire. *Sir J. E. Smith.*
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*
"Spores .002 in. long, by .001 in. broad." (*Mudd.*) "Spores .006—8 mm. long, .003—4 mm. broad." *(T. M. Fr.)*
The cartilaginous axis consists of longitudinal filaments closely compacted & lies in a loose arachnoid mass of anastomosing filaments, amongst which are the large conglomerations of bright green gonidia. The cortical layer is very thin & fragile, easily ruptured transversally. The medullary axis spreads out more or less at the base & thus fixes the plant to the substratum or matrix on which it grows. Asci narrow, clavate, Paraphyses cohærent, apices colourless, Gelatina hymenea I blue. Spores .009—.011 mm. long, .006—007 mm. broad.

f. 2. *hirta*, (L.) Fr. erect, minutely and abundantly *fibrillose*, much branched, *often only verrucoso-sorediate.*

On trees and pales, common. 1724.

SYN :—Linn. Sp. Pl. ed. 1. p. 1155. (1753). Mudd Man. 69. Nyl. Syn. 267. Fr. L. E. 18. (1831).
FIG :—E. Bot. 1354. Hoffm. Pl. Lich. t. 30. f. 1.
EXS :—Schær. 399. Mudd 35. Anzi It. S. 16. Hepp 828. Leight. 1.
GEOG. DISTRIB :—Northern Europe, N. America, Ceylon.
BOT. PROV :—1, 2...4, 5...10, 11, 12...14, 15...20.
ENGLAND :—Stockton Park; Ingleby; Greenhow, Yorkshire! *Mr. Mudd.* near Lewes, Sussex. *Mr. Borrer.* Northumberland and Durham. *Mr. Winch.* Haldon, Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* New Forest. *Rev. J. M. Crombie.* North Bovey; Manaton; Widdecombe, Devon. *Rev. J. P. Jones.* Courtwood, Ilsington; Berry Pomeroy Castle, Devon. *Messrs. Jones & Kingston.* Swinnop, East Allendale, Northumberland; Foreshield Wood, Alston, Cumberland. *Rev. W. Johnson.* Bury Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Aymestry! Herefordshire; Wrekin! Caradoc! Haughmond Hill! Valeswood! near Ludlow! and generally in Shropshire.
SCOTLAND :—Berwickshire. *Dr. G. Johnston.* near Aviemore in Strathspey. *Mr. Brodie.* Muchalls and Durris, Kincardineshire; Killin. *Rev. J. M. Crombie.*
IRELAND :—Glenbower Woods! near Youghal, co. Cork. *Mr. Carroll.*
WALES :—Conway Falls!

f. 3. *dasypoga*, (Ach.) Fr. *elongato-pendulous*, clothed with numerous *short spreading fibrillæ.*

SYN :—Fr. L. E. 18. (1831). Nyl. Scand. 69. Syn. 268. Mudd Man. 69.
FIG :—Dill. Musc. t. 12. f. 6.
EXS :—Anzi It. S. 13. Mass. 84.
GEOG. DISTRIB :—Europe, America, Madagascar, Java, Brazils.
BOT. PROV :—11...15...19
ENGLAND :—Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.*
SCOTLAND :—Kinnoul Hill, Perth. *Dr. Lindsay.* Countesswells, near Aberdeen; Killin. *Rev. J. M. Crombie.*
IRELAND :—Muckruss Demesne, Killarney and Castlebarnard Park, Bandon. *Mr. Carroll.*

f. 4. *plicata*, (L.) Fr. *pendulous*, entangled, not fibrilloso-ramose, *smooth.*

On trees and rocks, frequent. 1696.

SYN :—Fr. L. E. p. 13. (1831).
FIG :—E. Bot. 257. Dill. Musc. t. 11. f. 1. Nyl. Syn. t. 8. f, 9.
EXS :—Anzi Langob. 414. Hepp 829. Fellm. 49. Arn. 573.
GEOG DISTRIB :—Europe, America.
BOT. PROV :—1, 2, 3. 4...10, 11...13, 14, 15...20...26...31.
ENGLAND :—Woodcot Wood, Hampshire. *Mr. Doody.* (1696). Dorsetshire. *Dr. Pulteney.* Broughton Bank! Ingleby Park! Cleveland. *Mr. Mudd.* Correysthorpe Banks, Castlehoward, Yorkshire. *Mr. Teesdale.* near Bodmin. *Messrs. Turner & Sowerby.* Cambridgeshire. *Rev. R. Relhan.* Northwin, Herts. *Mr. Miller.* Waskerley Bourn, near Wolsingham, Durham. *Mr. Winch.* Haldon, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.*

SCOTLAND :—Barntimpen Linn, par. Kirkpatrick, Dumfriesshire. *Dr. Burgess.* Balmuta ; Pentland Hills ; Drumshoreland Muir. *Dr. Greville.* Berwickshire. *Dr. G. Johnston.* Kinfauns, Perth. *Dr. Lindsay.*
IRELAND :—Dawros river, Galway. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

f. 5. *articulata*, Ach. *pendulous*, elongato-ramose, smooth, *articulato-constricted*, more or less *inflated*.

On trees, rare. 1724.

SYN :—Ach. Meth. 313. (1803). Nyl. Scand. 69.
FIG :—E. Bot. 258. Dill. Musc. t. 11. f. 4.
EXS :—Dicks. 24. Schær. 497. Arn. 34.
GEOG. DISTRIB :—Europe, Asia, America, Canaries, Australasia.
BOT. PROV :—1...2...5...7...9...15...23.
ENGLAND :—Exmouth Warren, Devon. *Sir. W. J. Hooker.* Liskeard. *Messrs. Turner & Sowerby.* near Burnley, Lancashire. *Mr. Willisell.* (1724). near Stockenchurch, Oxford. *Mr. Bobart.* Gattley Park, Herefordshire : near Bishop's Castle, Salop. *Mr. L. Brown.* Forest of Dean, Gloucestershire. *Mr. T. Cole.* Haldon, Devon. *Mr. Parfitt.* near Exeter. *Rev. J. M. Crombie.* Widdecombe, *Rev. J. P. Jones.* Beckey Fall ; Bagtor Woods ; Chagford, Devon. *Messrs. Jones and Kingston.* Exmouth Warren ! Devon. *Mr. Parfitt.*
SCOTLAND :—Deerhill, and other Woods, Forfarshire. *Mr. W. Gardiner.*
IRELAND :—Malahide. *Mr. Mackay.* Portmarnock, near Dublin. *Dr. Taylor.*
WALES :—Cwm Bychan ; Bettws-y-Coed. *Rev. T. Salwey.*

f. 6. *ceratina*, Schær. thallus *erect or pendulous, papilloso-scabrous*, variously fibrilloso-ramose.

On trees, rare.

SYN :—Schær. Spicil. 505. (1840). Nyl. Scand. 69.
FIG :—Schær. Enum. t. 1. f. 1. Nyl. t. 8. f. 8.
EXS :—Schær. 400. M. & N. 465. Hepp 567. Spruce Am. 50. Mass. 83.
GEOG. DISTRIB :—Europe, Canaries, E. & W. Indies, Polynesia, N. Granada, Brazils.
BOT. PROV :—2 . 6...11...15.
ENGLAND :—Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.*
SCOTLAND :—Killin ; Breadalbane. *Rev. J. M. Crombie.* Kinnoull Hill, Perth. *Dr. Lindsay.*
WALES :—Hafod, Cardiganshire. *Sir J. E. Smith.*

f. 7. *rubiginea*, Ach. *rubiginose ;* apothecia concolorous.

On trees, rare. 1869.

SYN :—Ach. L. U. 621. (1810). Crombie in Seem. Journ. Bot. 8. 96.
FIG :—Mass. L. Capenses. t. 8. f. 23—26.
EXS :—Anzi Lang. 413.
GEOG. DISTRIB :—N. America, Brazils, Cape of Good Hope, Lombardy.
BOT. PROV :—2...5.
ENGLAND :—St. Leonards Forest, Sussex ; New Forest, Hants. *Rev. J. M. Crombie.* (1869). Hastings. *Dr. Holl.* Punbury Park, Gloucestershire. *Mr. W. Joshua.*

## TRIBE IX. RAMALINEI.

Thallus terete or compressed, erect or pendulous, internally with a woolly medulla. Apothecia concolorous or discolorous, lecanorine, thalline margin entire ; paraphyses distinct or indistinct. Spores various. Spermatia various.

### I. ALECTORIA, *Ach. pr. p. Nyl.*

Thallus terete or compressed, erect, prostrate or pendulous, filamentose, internally arachnoid or hollow, intricato-ramose,

epithallus shining. Apothecia with indistinct paraphyses. Spores ellipsoid. Spermatia slender, acicular, apically fusiformi-incrassate.

1. *A. bicolor*, (Ehrh.) *black or fusco-nigricant or castaneo-fuscescent*, terete, erect, much branched, *divaricato-fibrillose*, densely intricate, *paler at the apices; apothecia lateral*, adnate to an obtuse knot of the thallus, small, *nigricant*; *spores* 8, small, shortly ellipsoid. (K = C = )

On alpine rocks. 1795.

SYN :—Ehrh. Beytr. 3. p. 82. (1788) Nyl. Scand. 71. Syn. 279 Mudd Man. 70.
FIG :—E. Bot. 1853.
EXS :—M. & N. 167. Schær. 495. Tuck. 2. Mudd 39. Anzi Ven. 17, Arn. 400.
GEOG. DISTRIB :—Arctic Europe, Switzerland, France, Arctic America, Himalaya.
BOT. PROV :—1—7...10...15.
ENGLAND :—Stansfield Moor, near Halifax. *Mr. Baker*. Penzance. *Mr. Parfitt*. Kildare Moor; High Cliff! Cleveland and Farndale! Yorkshire. *Mr. Mudd*. Dartmoor. *Dr. Holl*. Cornwall. *Dr. Montgomery*.
SCOTLAND :—Ben-y-Gloe. *Mr. Dickson*. (1795). above Loch Tay. *Messrs. Turner & Hooker*. Aberfeldy, Perthshire. *Mr. Macmillan*. Top of Lochnagar! Braemar. *Dr. Lindsay*. near Top of Ben Lawers! *Mr. Carroll*. Clova Mountains. *Mr. W. Gardiner*. Breadalbane and Braemar! Canlochan. *Rev. J. M. Crombie*. Killin. *Dr. Holl*.
WALES :—Llyn Bodlyn! and Cwm Bychan, near Barmouth. *Rev. T. Salwey*. North Wales. *Rev. Hugh Davies*. Giant's Pebbles! Cader Idris; Aran Mowddy! Twll Du! Llyn-y-Cwn!
"Spores .007—8 mm. long. .005—6 mm. broad." (*Nyl.*) "Spores .007—8 mm. long. .005 - 6 mm. broad." (*T. M. Fr.*)

2. *A. divergens*, (Ach.) *fusco-castaneous or spadiceo-fuscescent, roundish or subangulate*, erect or prostrate, *rigescent*, somewhat *shining*, very much branched, branches *divergenti-dichotomous*. (K = C $\overline{\text{red}}$); "apotheciis innato-sessilibus, crenulatis, discocastaneo." Fr.

On the earth in alpine places; very rare. 1872.

SYN :—*Cornicularia*, Ach. Meth. 303 (1803). Whlnb. Fl. Lapp. 439. Nyl. Scand. 71 Syn. 278. Crombie in Journ. Bot. n. s. 2. p. 133.
FIG : —Ach. Meth. t. 6. f. 1.
EXS :—Fries 331. Richardson 64. Smrf. 154. Th. M. Fries 53.
GEOG. DISTRIB :—Scandinavia, Austria, Arctic America.
BOT. PROV :—15.
SCOTLAND :—Summit of Cairngorm in Braemar, small state, *Rev. J. M. Crombie*. (1872).

2. *A. nigricans*, (Ach.) *castaneo-nigricant, paler at base*, terete, or sub-compressed, erect or ascending, *opake, dichotomously branched* intricate, *axils more or less lacunoso-impressed*; apothecia badio-fuscous, lateral or terminal, adnate; spores 2-3, colourless, large, ellipsoid. (K yellow C red).

On alpine rocks, rare.

SYN :—Ach. L. U. 615. (1810). Nyl. Scand. 71.
FIG :—Nyl. Syn. t. 8. f. 17.
EXS :—Fellm. 54. Korb. 241. Th. Fr. 28.
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—15.
SCOTLAND :—Ben Nevis; Braemar; Ben-na-boord; Ben Lawers! Ben-y-gloe! *Rev. J. M. Crombie*. Ben Nevis. *Adm. Jones*.
In herbaria it tinges the paper with a reddish colour. "Spores .021—35 mm. long, .015—20 mm. broad." (*T. M. Fr.*)

3. *A. ochroleuca*, (Ehrh.) *ochroleucous*, fruticulose, *erect, rigescent*, terete or compressed, smooth, lacunoso-impressed, albo-sorediate, branched, ramuli attenuate, *apically denigrate;* apothecia dark brown, large, receptacle appendiculate ; spores 2 or 4, fuscous, large, ellipsoid. (K *f* + C +)

On the earth in alpine places.

SYN :—Ehrh. Beytr. 3. p. 82. (1788). Nyl. Scan. 72. Syn. 281. Mudd. Man. 70. T. M. Fries. Scand. 19.
FIG :—Hoffm. Pl. Lich. t. 26. f. 2. & t. 68. f. 5. 7. Nyl. Syn. t. 8. f. 21. E. Bot. t. 2374.
EXS :—M. & N. 853. Schær. 395. Fellm. 52. Zw. 384. Hepp 832. Anzi It. S. 23. Mass. 48. Reich. & Schub. 67. Arn. 135.
GEOG. DISTRIB :—Alps & Arctic Europe & N. America, Himalaya, Mexico, Japan, New Holland.
BOT. PROV :—7...11...15.
SCOTLAND :—Highlands of Scotland. *Mr. Macmillan.* Cairntoul, Braemar, *Rev. J. M. Crombie.* Cairngorm, Inverness-shire. *Sir W. J. Hooker.*
WALES :—Cwm Bychan ! near Barmouth. *Rev. T. Salwey.*
"Spores .034—46 mm. long, .020—28 mm. broad." (*Nyl.*) "Spores .028—.42 mm. long, .014–24 mm. broad." (*T. M. Fr.*) Spores .028 mm. long, 015 mm. broad.

f. *tenuior*, Cromb. *smaller, erect*, branches slenderer, *concolorous at the apices.*

On alpine mountains. 1808.

SYN :—Crombie in Journ. Bot. n. s. 1. p. 232. (1872).
FIG :—E. Bot. t. 2040 (smaller figure).
SCOTLAND :—Ben Luighal, Sutherlandshire. *Sir W. J. Hooker.* (1808). Morrone, Braemar. *Rev. J. M. Crombie.*

Var. *cincinnata*, Fr. *prostrate, compressed, thicker, dilated below, lacunose or foveolate*, with long slender attenuate entangled branches above. (K f + C +) medulla K—C reddish.

In alpine places, rare. 1808.

SYN :—Fr. L. E. 22. (1830). Nyl. Scand. 73.
FIG :—E. Bot. 2040. (larger specimen).
EXS :—Fellm. 53.
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—15, 16.
SCOTLAND :—Morrone ; Ben-na-boord ; Ben Lawers ! *Rev. J. M. Crombie.* Ben-Mac-Dhiu. *Mr. Macmillan.* Ben Luighal, Sutherland, and Cairngorm, Invernessshire. *Messrs. Hooker & Borrer.* (1808.) Summits of Morne and Morchone, Braemar. *Dr. W. L. Lindsay.*

Var. *sarmentosa* (Ach.) *pendulous*, elongate, complicate, *flaccid*, distantly branched, axils compressed, *apices* attenuate *concolorous.*

*Alectoria sarmentosa*, Ach. L. U. 595. is a distinct species with chemical reaction (K=C+) and is represented in Th. Fr. 27. M. & N. 755, 464. and in Hoffm. Pl. Lich. t. 72.

Amongst mosses in alpine localities, very rare.

SYN :—Ach. Syn. 293. Nyl. Syn. 282.
SCOTLAND :—near Summit of Cairngorm, Braemar. *Mr. W. Wilson. in hb. Brit. Mus.*

4. *A. capillaris*, (Ach.) Nyl. pallido-canescent or pale flavido-rufescent, pendulous, elongate, dichotomously branched, flaccid, densely entangled, sub-compressed, angular and sublacunose below, filiform and capillary above ; apothecia unknown. (K + C +).

On trees, &c.

SYN :—*Alectoria jubata, var. cana & setacea*, Ach. L. U. 593. (1810.)

FIG :—Westr. Sv. Lafv. Farg.-Hist. V. 1. n. 14. Fig. B.
EXS :—Schær. 496. Anzi It. S. 18, 19, 20. Th. Fr. 52. Hepp. 831.
GEOG. DISTRIB :—Europe.
BOT. PROV :—10. 15.
ENGLAND :—Yorkshire! *Mr. Dixon.*
SCOTLAND: Killin, Braemar. *Rev. J. M. Crombie.*
The different chemical reaction appears to separate this as a distinct species from all forms of *A. jubata.*

*A. subcana*, Nyl. MS. is said to have been gathered on trunks of old firs, on Ben Lawers and Glen Derry, Braemar, by *Rev. J. M. Crombie;* but I have seen no specimen, nor am I aware of any published diagnosis.

5. *A. jubata*, (Linn.) Nyl. fuscous or nigricant, livido-fuscescent or pallescent, terete, filiform, elongate, slender, ramose, pendulous or prostrate, entangled; apothecia brown, plane or convex, small; spores 8, colourless, small, elliptical. (K — C —)

On trees and rocks in mountainous places.

SYN :—*A. jubata var. prolixa.* Ach. L. U. 592. (1810). Nyl. Scand. 72. Syn. 280. Mudd Man. 70.
FIG :—E. Bot. 1880. Nyl. Syn. t. 8. f. 18 & 19. Dill. t. 12. f. 7.
EXS :—Schær. 396. 397. 496. Mudd 37. Leight. 72.
GEOG. DISTRIB :—Europe, N. America, W. Indies, N. Africa, Canaries, Himalaya, Java.
BOT. PROV :—1, 2...5...7, 8...10, 11...14, 15...18...22, 23.
ENGLAND :—Tors of Dartmoor; Hightor Rocks, Devon. *Messrs. Jones & Kingston.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Baysdale! Ayton Moor! Kildale Moor; Cleveland. *Mr. Mudd.* Dartmouth. *Mr. R. Brown.* Longformacus, Northumberland. *Mr. T. Brown.* Rawse Castle; Longridge Dean; Murton Craigs; Dirrington Law, Northumberland. *Dr. G. Johnston.* Ludlow and Oswestry!, Shropshire. *Rev. T. Salwey.* Malvern Hills, Worcestershire; Ragley, near Kingley, Warwickshire. *Mr. Purton.* Gateshead Fell, Durham. *Mr. Thornhill.* Dartmoor; near St. Leonard's, Sussex. *Dr. Holl.* Charnwood Forest; Gopsall. *Rev. A. Bloxam.* Lustleigh Cleve, Devon. *Mr. Parfitt.* Pearts Craigs, near Settle. *Dr. Windsor.* Bedfordshire. *Rev. C. Abbot.* Longmynd! Shropshire.
SCOTLAND :—Deerhill Woods, Forfarshire! *Dr. G. Lawson.* Invercauld, Braemar! Craig-y-Barns, Dunkeld! Knock-Hill, Crieff! *Dr. Lindsay.* Pentland Hills; Swanston Wood. *Dr. Greville.* Killin; Rothiemurchus. *Rev. J. M. Crombie.* Garrynahine, Lewis. *Dr. Lindsay.*
IRELAND :—Knockcurris, Innishowen. *Mr. R. Brown.* Lough Bray; Killiney Hills. *Dr. Taylor.* Luggelaw, co. Wicklow. *Adm. Jones.*
WALES :—Diffwys; Llyn Bodlyn! near Barmouth. *Rev. T. Salwey.* Cader Idris. *Dr. Holl.*
"Spores .006—9 mm. long, .004–5 mm. broad." *(Nyl.)* "Spores .006–1 mm. long, .004—5 mm. broad." *(T. M. Fr.)*

Var. *chalybeiformis*, Ach. olivaceo-black, flexuose, *decumbent*, subfilamentose, wiry and rigid, *shortly branched*, *intricate*. (K—C—)

On alpine rocks and boulders.

SYN :—Linn. Syst. Nat. (1767). Syn. 280. Mudd Man. 70. Ach. L. U. 593.
FIG :—Dill. t. 13. f. 10.
EXS :—Mudd 38. Schær. 396. Anzi It. S. 21.
GEOG. DISTRIB :—Europe.
BOT. PROV :—10, 11...15.
ENGLAND :—Battersby Bank! Cleveland. *Mr. Mudd.* Charnberry, near Eglestone, Durham. *Mr. Winch.*
SCOTLAND :—Loch-na-gar!! Braemar; Birnam Hill! Dunkeld. *Dr. Lindsay.* Highlands. *Messrs. Turner & Hooker.* Clova Mountains. *Mr. W. Gardiner.*

6. *A. lanata*, (L.) nigricant or fusco-nigricant, *filiform*, *terete*,

*slender*, decumbent, *ramose*, *entangled*, shining; apothecia lateral, concolorous, margin sub-entire or *granulato-unequal;* spores 8, colourless, elliptical, simple; medulla white K—C—.

On alpine rocks. 1724.

SYN :—Linn. Sp. Pl. ed. 1. No. 74. (1753) Ach. Syn. 302. *Parmelia*, Nyl. Syn. 398. Mudd Man. 101.
FIG :—E. Bot. 846 (middle fig).
EXS :—Fellm. 82. Hepp 588. Anzi Langob. 53. M. & N. 557. Schær. 257.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5...7...11, 12...15...19...23...26.
ENGLAND :—Northern Counties. *Sir J. E. Smith.* Helvellyn! *Mrs. Stanger.* Teesdale Moors, Durham; Cheviot, Simonside and Hedgehope, Northumberland. *Mr. Winch.* Ragley Park, Warwickshire. *Mr. Purton.* Cornwall. *Mr. Stephens.* (1724). Tors of Dartmoor. *Rev. Mr. Newberry.*
SCOTLAND :—High Mountains. *Sir J. E. Smith.* Ben More; Bennaboord; Massuna, Bramaer! Ben Lawers! Ben-y-gloe. *Rev. J. M. Crombie.* Ben Macdhui; Lochnagar! *Dr. Lindsay.* Ben Nevis. *Adm. Jones.* near Aberfeldy, Perthshire. *Mr. H. Macmillan.*
IRELAND :—Mangerton, co. Kerry. *Mr. J. Carroll.* near Belfast. *Mr. Templeton.* On the mountains in the South. *Dr. Taylor.* McGillicuddy's Reeks. *Dr. Moore.* Summit of Doughruagh! co. Galway. *Mr. Larbalestier.*
WALES :—Borth and Snowdon. *Dillenius.* Bangor. *Mr. Brewer.* Cader Idris! *Rev. T. Salwey.*
"Spores .00225 in. long, by .00125 in. broad." *(Mudd).* "Spores .009—.012 mm. long, .007—8 mm. broad." *(Nyl.)* "Spores .007—11 mm. long, .006—8 mm broad." *(T. M. Fr.)*

*F. minuscula*, Nyl. filaments entangled, diminutive, scabrous.

On alpine rocks.

SYN:—Nyl. Lapp. or. 120. Crombie in Journ. Bot. n. s. 1. p.. 233. *Lichen scaber*, Huds. 562. 661.
FIG :—E. Bot. t. 2318 (small right hand fig).
EXS :—Fellm. 83.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV.:—7...15.
SCOTLAND :—Ben Lomond. *Herb. Sowerby.*
WALES :—Llanberis. Snowdon. *Herb. Sowerby.*

Var. *parmelioides*, Cromb. thallus suborbicular, somewhat closely appressed, black or blackish (not olive-brown), opaque, laciniæ shorter, more intricately divided, margin of apothecia granulato-unequal or ciliated.

On alpine rocks.

SYN :—Crombie in Journ. Bot. n. s. 1. p. 233 (1872). *Lichen pubescens*, Lightf. Fl. Scot. p. 893. teste Herb. Pult. &c. in Mus. Brit.
FIG :—E. Bot. t. 846. (upper and lower fig.) Dill. Musc. t. 17. f. 32.
EXS :—Cromb. 20.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar; summit of Ben-y-gloe. *Rev. J. M. Crombie.*

*F. subciliata*, Nyl. margin of apothecia ciliated with spinuliform papillæ.

On calcareous rocks.

SYN :—Nyl. in Flora 1868 p. 346. Crombie l. c.
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.*

## II. EVERNIA. *Ach. Nyl.*

Thallus flaccid, erect or ascending or prostrate or pendulous, applanate or subterete, laciniose, or very much branched, destitute of rhizinæ beneath, internally stuppeous. Apothecia lateral, lecano-

rine. Spores small, ellipsoid, simple. Paraphyses indistinct. Sterigmata pauci-articulate. Spermatia slender, acicular, fusiformi-incrassate and acute at both apices.

1. *E. furfuracea*, Mann. *cinerascent*, dichotomously multi-laciniate, *upper surface isidioso-furfuraceous or fibrillose, under surface canaliculate black or cæsio-nigricant;* apothecia sub-marginal, badio-rufous, *receptacle smooth;* spores ellipsoid. (K + C +) medulla K—C red.

On trees, pales, &c. common.

SYN :—Mann. Lich. Boh. p. 105. (1826). Nyl. Scand. 73. Syn. 284. Mudd Man. 71.

FIG :—E. Bot. 984. Hoffm. Pl. Lich. t. 9. f. 2. Hepp Sporen. t. 95. f. 834.

EXS .—Tuck 55. M. & N. 63. Schær. 387. Anzi It S. 71. Hepp 834. Mudd 40. Leight. 37. Reich. & Schub. 12.

GEOG. DISTRIB :—Europe, N. Africa, Canaries, Asia, N. & Central America.

BOT. PROV :—1...5...7...10, 11 15...23.

ENGLAND :—Eglestone, Durham. *Rev. J. Harriman.* Farndale ! Ayton Moor ! Yorkshire. *Mr. Mudd.* Oswestry ! Myndd-y-Myfyr ! Shropshire. *Rev. T. Salwey.* Chillingham Park ; Rawse Castle, Northumberland. *Dr. G. Johnston.* Dartmoor. *Mr. Parfitt.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Wrekin ! Caer Caradoc ! Hay Park ! near Ludlow, and other places ! in Shropshire.

SCOTLAND :—Balthayock Woods, Perth ! Johnston Hill ! Forfar. *Dr. Lindsay.* Deerhill and Baldovan Woods, Forfarshire. *Mr. W. Gardiner.* Killin ; Braemar. *Rev. J. M. Crombie.* Ben Lawers ; Crianlarich. *Dr. Holl.*

IRELAND :—Lough Bray, near Dublin. *Dr. Taylor.* Rochestown Hill, co. Dublin. *Herb. Trin. Coll. Dubl.*

WALES :—Cwm Bychan, near Barmouth. *Rev. T. Salwey.*

"Spores .00175 in. long. by .001 in. broad (t. 1. f. 16)." *(Mudd.)* "Spores .007—.010 mm. long, .0035—.055 mm. broad." *(Nyl.)* "Spores .007—10 mm. long, .004—5 mm. broad." *(T. M. Fr.)*

2. *E. prunastri*, (L.) *whitish*, or albido-pallescent or albido-flavescent, multi-laciniate, *lacunoso-rugose, margins generally albo-sorediate*, subcanaliculate and pale beneath ; apothecia lateral or marginal, badio-rufous, *receptacle rugose ;* spores ellipsoid. (K + C + medulla K—C—)

On trees, common.

SYN :—Linn. Sp. Pl. 1614. (1753). Nyl. Scand. 74. Syn. 285. Mudd Man. 72.

FIG :—E. Bot. 859. Hepp Sporen. t. 95. f. 833.

EXS :—M. & N. 355. Tuck. 54. Schær. 391. Anzi It. S. 70. Hepp 833. Mudd 41. Leight. 36. Larbal. 59.

GEOG. DISTRIB :—Europe, N. Africa, Asia, N. America, Peru.

BOT. PROV :—1...3...5...7...10, 11, 12...15...19, 20...30, 31.

ENGLAND :—Thirsk ! Yorkshire. *Mr. Baker.* Oswestry ! Shropshire. *Rev. T. Salwey.* Keswick, ! Cumberland. *Mrs. Stanger.* Lounsdale ! and Kildale ! Cleveland. *Mr. Mudd.* Berwick-on-Tweed. *Dr. G. Johnston.* Gibside Woods, Durham. *Mr. Winch.* Wallington, Northumberland. *Miss Trevelyan.* Essex. *Mr. Varenne.* Holbrig Hall, near Settle. *Dr. Windsor.* Midland Counties. *Mr. Purton.* Moreton, Devon. *Rev. J. P. Jones.* Suffolk and Sussex. *Rev. E. N. Bloomfield.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Nesscliffe ! Bomere Pool ! Haughmond Hill ! Shrewsbury ! Shropshire. Dinmore ! Herefordshire.

SCOTLAND :—Kinnoul Hill ! Perth ; Arniston Woods ! Edinburgh ; Blaeberry Hill ! Perth. *Dr. Lindsay.* Deerhill and other woods on the Sidlaws. *Mr. Gardiner.* Falls of Moness, Aberfeldy. *Dr. Holl.* Killin ; Braemar ; Durris ; Countesswells. *Rev. J. M. Crombie.*

IRELAND :—Castlebernard Park ! Bandon ; Blarney ; Castlemary ! near Cork. *Mr. Carroll.* near Belfast. *Mr. Templeton.* near Bantry. *Miss Hutchins.* near Killarney. *Mr. Gough.*

WALES :—Cessel Cwm and Cwm Bychan, near Barmouth. *Rev. T. Salwey.* Breidden !

CHANNEL ISLANDS :—Jersey, Guernsey, *Mr. Larbalestier.*
"Spores .002 in. long, by .001 in. broad." *(Mudd.)* "Spores .007—9 mm. long, by .0045—55 mm. broad." *(Nyl.)* "Spores .007—10 mm. long, .0045—60 mm. broad." *(T. M. Fr.)*

Var. *stictocera*, Ach. laciniæ scattered over with prominent dark fuscous cephalodia.

On trees, not uncommon.

SYN :—Ach. L. U. p. 442. Nyl. Syn. 285. Crombie in Journ. Bot. n. s. 1. p. 233.
FIG :—Ach. l. c. t. 10. f. 3. B.
BOT. PROV :—5...15.
ENGLAND :—Nesscliffe Hill! Wrekin! Shropshire.
SCOTLAND :—Firwood above manse at Killin. *Rev. J. M. Crombie.*

Var. *gracilis*, Ach. thallus with small fuscous or fuscous-black tubercles on the apices (K+C+).

On sandy banks and shrubs.

SYN :—Ach. L. U. 442.
FIG :—E. Bot. t. 1353 Westring Faergh. t. 11 C.
GEOG. DISTRIB:—Sweden.
BOT. PROV :—1...31.
ENGLAND :—Warren opposite Exmouth, Devonshire. *Mr. Brodie.*
CHANNEL ISLANDS :—Quenvais, Jersey! *Mr. Larbalestier.*

Mr. Parfitt (in litt.) says, "The habits of this plant in this locality (Exmouth), so far as I know, have not been described. The plant grows attached to the stems and branches of Erica tetralix, and nearly all the branches of the Evernia, but more particularly in the largest plants, become decumbent and attach themselves to the branches of the Erica, also and in every instance where this is the case the apices secrete those dark disks. An examination of these dark dots under a high magnifying power shows them to be composed of a number of minute hyaline filaments surmounted with a dark brown grumous mass of cells, which are more or less tenacious or glutinous when moist, and adhere firmly to anything to which they may attach themselves."

## III. RAMALINA. *Ach. Fr.*

Thallus whitish or pale, compressed, somewhat shining, rigescent, erect or prostrate, laciniate, alike on both sides. Apothecia scattered or marginal, concolorous. Spores colourless, oblong, curved, 1-septate. Paraphyses distinct. Sterigmata elongato-pauci-articulate with anastomosing filaments. Spermatia cylindrical, or oblongo-cylindrical, straight.

1. *R. thrausta*, (Ach.). pale straw-colour, *filiform-terete* or *subterete*, here and there compressed, somewhat shining, very slenderly divided, and *excessively branched, capillari-attenuate and interwoven at the apices;* cortical layer filamentose; medulla K—; apothecia unknown.

On old firs and sandy soil in subalpine regions, rare. (1860).

SYN : —*Alectoria thrausta*, Ach. L. U. 596, Syn. 294. *R. thrausta*, Nyl. Mon. Ramal. 18; Leight. Not. Lich. 35; Crombie in Journ. Bot. n. s. 1. 71.
EXS :—Fries L. S. 267. Arn. 574. a. b. c. d. e.
GEOG. DISTRIB :—Europe.
BOT. PROV :—17.
SCOTLAND :—Bay of Nigg, Coast of Kincardineshire. *Rev J. M. Crombie.* (1860).

2. *R. calicaris*, (Hffm.). pale glaucous-grey, or albido-flavescent, rigescent, erect, dichotomously branched; *laciniæ linear, compressed, elongated, attenuated at the apices, longitudinally lacunoso-*

*canaliculate;* cortical layer filamentose; medulla K—; *apothecia terminal, subtended by the deflexed and elongated extremities of the laciniæ; receptacle rugose beneath; spores* 8, colourless, ellipsoid, *straight*, 1-septate; spermogonia in pale or colourless receptacles.

On trees, common.

SYN:—*Lobaria calicaris*, Hffm. Fl. Germ. 139. *R. fastigiata*, var. *calicaris* Ach. L. U. 604. Syn. 297. *R. calicaris* var. *canaliculata*, Fr. L. E. 30. *R. calicaris*, Nyl. Mon. Ramal. 33; Leight. Not. Lich. 35. Crombie in Journ. Bot. n. s. 1. 71.

FIG:—Dill. t. 23, f. 62, A, B; Moris. 3, § 15, t. 7. f. 5; Ach. Act. Holm. 1797, t. 9. f. 1, I.

EXS:—M. & N. 452; Mudd 44; Welw. Lusit. 42.

GEOG. DISTRIB:—Europe, Asia, Africa, North and South America.

BOT. PROV:—1, 2...5, 6, 7...10, 11...13...15.

ENGLAND:—New Forest. *Rev. J. M. Crombie.* Airyholme woods! Ayton, Yorkshire. *Mr. Mudd.* Oswestry! Shropshire. *Rev. T. Salwey.* Culverhouse and Exmouth Warren! Devon. *Mr. Parfitt*, Moreton, Devon. *Rev. J. P. Jones.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Shropshire generally!

SCOTLAND:—Ayrshire!, *Mrs. Dobie.* Johnstone Hill, Forfar! *Dr. Gilchrist.*

WALES:—Llandrinod! Radnorshire. *Rev. T. Salwey.* Trefriw!

"Spores .010—16 mm. long, .005—7 mm. broad." *(Nyl.)*

Var. *subampliata*, Nyl. *laciniæ* of thallus *broader and more dilated*, similarly to *R. fraxinea*, longitudinally nervoso-rugose, lacunose and canaliculate; *apothecia marginal and terminal; receptacle rugose; spores straight.*

On trees.

SYN:—Nyl. Mon. Ramal. 34 (1870). Leight. Not. Lich. 35.

FIG:—Ach. Act. Holm. 1797, t. 9, f, 1. G, K.

EXS:—Anzi Lich. Ital. Sup. 63; Anzi Langob. 419.

GEOG. DISTRIB:—France, Portugal, Algeria, East Indies.

BOT. PROV:—1, 2...4, 5...10.

ENGLAND:—Yorkshire! *Mr. G. Dixon.* Exminster! Devon. *Mr Parfitt.* near Lyndhurst, New Forest. *Rev. J. M. Crombie.* Beeding! Suffolk. *Rev. A. Bloxam.* Llanyblodwel rocks.

Var. *svbfastigiata*, Nyl. similar in general appearance to *R. fastigiata*; *apothecia terminal; receptacle rugose; spores straight.*

On rocks and trees.

SYN:—Nyl. Mon. Ramal. 34 (1870). Leight. Not. Lich. 35.

FIG:—Ach. Act. Holm. 1797, t. 9. f. 1, H.

EXS:—Welw. Lusit. 44; Maudon Mad. 24.

GEOG. DISTRIB:—France, Portugal, Madeira, North America.

BOT. PROV:—6...12...19.

ENGLAND:—Foresheild Wood, Alston, Cumberland. *Rev. W. Johnston.*

IRELAND:—Rocks near Coachford, 11 miles west of Cork! *Mr. Carroll.* near Fermoy! *Mr. Chandler.*

WALES:—Llandrindod! *Rev. T. Salwey.*

Mr. Crombie, l. c. mentions a somewhat unusual state, with laciniæ much attenuated (f. *attenuata, Cromb.*) in New Forest; and also a singularly cæspitose condition with very short and crowded laciniæ from Swanston Wood, near Edinburgh. *Mr. Sadler.*

3. *R. farinacea* (L.) whitish, pale straw-coloured or glaucescent, erect, subrigescent, dichotomously branched; *laciniæ linear, elongated, undulato-attenuated at the apices, compressed, plane and polished*, sometimes sublacunose, canaliculate *with white, oblong, more or less confluent soredia on the edges;* cortical layer filamentose; medulla K—; "apothecia testaceopallida vel glau-

cescentia, receptaculo infra lævi; sporæ ellipsoideo-oblongæ vel fusiformi-ellipsoideæ, rectæ" (Nyl. Mon. 35); spermogonia in pale or colourless receptacles.

On trees and palings, frequent, rare in fructification.

SYN :—*Lichen farinaceus*, Linn. Fl. Suec. ed. 2, 1089. *R. farinacea*, Ach. L. U. 606, Syn. 297; Nyl. Mon. Ramal. 34; Leight. Not. Lich. 35. Crombie in Journ. Bot. n. s. l. 71.

FIG .—E. Bot. t. 889; Ach. Act. Holm. 1797, t. 11. f. 1.

EXS :—M. & N. 356; Anzi Etr. 6; Anzi Ital. Sup. 67; Schær. 494; Mudd 45. Rabh. 892.

GEOG. DISTRIB :—Europe, Asia Africa, North and South America, Polynesia, Australia.

BOT. PROV :—1, 2...4, 5, 6, 7...10, 11, 12. 13...15.

ENGLAND :—Norfolk. *Rev. H. Bryant*. Clapham Park Wood, Bedfordshire (fruit). *Rev. C. Abbot*. New Forest (fruit). *Mr. Lyell*. near Newton! and Kildale! Cleveland, Yorkshire! *Mr. Mudd*. Oswestry! Shropshire. *Rev. T. Salwey*. Thirsk!, Yorkshire, *Mr. Baker*. Stoke Wood! Exeter. *Mr. Parfitt*. Chichester! *Mr. Cooke*. Foreshield Wood, Alston, Cumberland; Swinnop, East Allendale, Northumberland. *Rev. W. Johnson*. Moreton, Devon. *Rev. J. P. Jones*. Suffolk and Sussex. *Rev. E. N. Bloomfield*. Shomere Woods! Haughmond Hill! Lyth Hill! Shropshire; Dinmore Wood, Herefordshire

SCOTLAND :—Balthayock Woods! Perth. *Dr. Lindsay*. Ayrshire! *Mrs. Dobie*.

IRELAND :—Fermoy! *Mr. Chandler*. Dunkerron (fruit) *Dr. Taylor*.

WALES :—Carmarthenshire! (fruit). *Mr. Forster*. Glynn, near Capel Curig! Bettws-y-Coed! Breidden!

Very variable; many forms, minute in size, frequently occur, but scarcely worth distinguishing. When the soredia in *R. farinacea* are touched with K they exhibit no reaction or only sometimes a very faint yellow, which, on the immediate application of C. becomes of a full yellow. "Spores .008—.016 mm. long, .004—7 mm. broad." (*Nyl.*)

4. *R. fraxinea*, (L.) pale straw or yellowish, or glaucescent, *pendulous, straggling*, subrigescent; laciniæ compressed, *more or less broadly applanato-dilated*, lacunose, longitudinally rugose or nervose, *elongated and attenuated at the apices*; cortical layer filamentose; medulla K—; *apothecia* large, *marginal and superficial*, brownish-yellow or glaucescent; *receptacle rugose or plicato-rugose*; *spores* 8, colourless, oblong, *curved*, 1-septate; spermogonia in pale colourless receptacles.

On trees, very common.

SYN :—*Lichen fraxineus*, Linn. Fl. Suec. ed. 2. 1091. *R. fraxinea*, Ach. L. U. 602. Syn. 296; Nyl. Mon. Ramal. 36; Leight. Not. Lich. 35; Crombie in Journ. Bot. n. s. l. 72.

GEOG. DISTRIB :—S. and C. Europe, N. America, Algeria, Canaries, Syria.

Forma typica *tæniæformis*, Ach. *laciniæ moderately dilated*, very much *elongated, attenuate at the base and apex, longitudinally rugose* or nervoso-plicate.

SYN :—*R. fraxinea*, var. *tæniæformis*, Ach. L. U., 603; Nyl. Mon. Ramal. 37.

FIG :—E. Bot. t. 1781; Westr. Faergh. t. 12. c.

EXS :—Anzi Ital. Sup. 60, and 59, A. B. D. Mass. Ital. 116; M. & N. 158 (two lower specimens); Schær. 492; (left hand specimen).

GEOG. DISTRIB :—Europe, Asia, Africa, North and South America, Polynesia, Australia.

BOT. PROV :—1, 2...4...6, 7...11.

ENGLAND :—Cambridgeshire. *Rev. R. Relhan*. Moreton, Devon. *Rev. J. P. Jones*. Swinnop, and Sparta Lea, East Allendale, Nnrthumberland. *Rev. W. Johnson*. Suffolk and Sussex. *Rev. E. N. Bloomfield*.

WALES :—Llandrindod! *Rev. T. Salwey*. Edderton Wood! Montgomeryshire.

"Spores .011—16 mm. long, .005—7 mm. broad." (*Nyl.*)

Forma *ampliata*, Ach. *Laciniæ excessively and very broadly applanato-dilated*, lacunose, *longitudinally coarsely rugose or nervose, and transversely subreticulato-rugose, apices obtuse and deformed.*

SYN :—*R. fraxinea*, var. *ampliata*, Ach. L. U. 603; Nyl. Mon. Ramal. 37.
FIG :—Hoffm. Pl. Lich. t. 18; Dill. t. 22. fig. 59. c.
EXS :—Anzi Ital. Sup. 2, 9, c; Schær. 492 (right-hand specimen); M. & N. (upper specimen); Leight. 38; Mass. 119. 118, A; Mudd 42; Bohl. 21.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5...7, 8...10, 11, 12...15.
ENGLAND :—Charnwood Forest! Leicestershire. *Rev. A. Bloxam.* Thirsk! Yorkshire. *Mr. Baker.* Oswestry! Shropshire. *Rev. T. Salwey.* near Ayton! Cleveland. *Mr. Mudd.* Exminster! Devon. *Mr. Parfitt.* Foreshield Wood, Alston, Cumberland; Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* near Shrewsbury! Dinmore Wood! Herefordshire; Pulley! Llanyblodwel rocks! Shropshire.
SCOTLAND :—Invercald! Braemar. *Dr. Lindsay.*
WALES :—Edderton Wood! Montgomeryshire.

5. *R. fastigiata*, (Pers.) pale yellowish straw-colour, small, *densely cæspitose, laciniæ* subcompressed, *dilated and inflated upwards*, smooth and somewhat lacunose and nervoso-rugose; cortical layer filamentose; medulla K—; apothecia terminal, peltato-sessile, *subfastigiate, subtended by the very short deformed divaricate extremities of the laciniæ; receptacle plicato-rugose; spores* 8, colourless, ellipsoideo-oblong, *straight, curved and gibbous*, 1-septate; spermogonia in pale colourless receptacles.

On trees, common.

SYN :—*Lichen fastigiatus*, Pers. in Uster. N. Ann. Bot. 1. p. 256. *R. fastigiata*, Ach. L. U. 603, Syn. 296; Nyl. Mon. Ramal. 39; Leight. Not. Lich. 35; Crombie. l. c.
FIG :—E. Bot. t. 890 (lower left-hand fig.); Dill. t. 23. f. 62, c; Ach. in Act. Holm. 1797, t. 9. f. 1, B, E.; Westr. Faergh. t. 12. f. E.
EXS :—Bohl. 22; Leight. 39; Larbal. 60; Mudd 43; Welw. Lusit. 41; M. & N. 452; Anzi Etr. 5; Anzi Ital. Sup. 64.
GEOG. DISTRIB :—Europe, Asia, Africa, North America.
BOT. PROV :—1...4, 5...7, 8...10, 11, 12...14, 15...19...31.
ENGLAND :—Bedfordshire. *Rev. C. Abbot.* Charnwood Forest! Leicestershire. *Rev. A. Bloxam.* Oswestry! Shropshire. *Rev. T. Salwey.* Ayton! Cleveland. *Mr Mudd.* Foreshield Wood, Alston, Cumberland; Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Lustleigh Cleve; Hightor Rocks; Bagtor Woods, and Devon. *Messrs. Jones and Kingston.* Pulley! Haughmond Hill! Lyth Hill! near Shrewsbury! Llanyblodwel Rocks! Shropshire; Dinmore! Herefordshire.
SCOTLAND :—Kinnoul Hill! Perth; Yester House! Haddington. *Dr. Lindsay.*
IRELAND :—Great Island! Cork. *Mr. Carroll.*
WALES :—Edderton Wood! Montgomeryshire; Bettws-y-coed.
CHANNEL ISLANDS :—Jersey! Sark! &c. *Mr. Larbalestier.*

Of this lichen Dr. Nylander remarks (*l. c.*) :—"Vix est nisi varietas *R. fraxineæ* thallo magis contracto et subfastigiato-diviso vel laciniis subfastigiatis. Sporæ magis typice curvulæ quam in *R. calicari* quæ certe arctissime affini et forsan hæ ambæ aliæque cohabitantes sæpe hybridas proferant formas intercedentes quarum determinatio aliquando nonnihil incerta maneat; typus tamen sæpius notis datis sat facile est agnoscendus."

"Spores .002—17 mm. long, .009—7 mm. broad." *(Nyl.)*

6. *R. polymorpha*, Ach. pale straw-colour or glaucescent, rigid, small, *robust, densely cæspitose*, sublineari-laciniate, *laciniæ dilatato-compressed, coarsely longitudinally striato-rugose and sublacunose, subopake, globuloso-granuloso-sorediate*; cortical layer filamentose; medulla K—; apothecia marginal or subterminal; *re-*

*ceptacle rugoso-unequal or nearly smooth; spores* 8, colourless, oblongo-ellipsoid or oblong, *nearly straight or straight*, 1-septate; spermogonia in pale colourless receptacles.

On maritime inland rocks, frequent, rare in fruit.

SYN :—*R. polymorpha*, Ach. L. U. 600. Syn. 295; Nyl. Mon. Ramal. 50; Crombie l. c. 72.
FIG :—Ach. Act. Holm. 1797, t. 11. f. 3.
EXS :—Fries L. S. 144.
GEOG. DISTRIB :—Europe. Africa.
"Spores .011—16 mm. long, .004—5 mm. broad." (*Nyl.*)

Forma *ligulata*, Ach. *laciniæ thick*, rigid, cartilaginous, *either plane*, and nearly simple or *broader and deformed, and covered with sorediate pustules.*

On maritime rocks.

SYN :—*R. polymorpha*. var. *ligulata*, Ach. Syn. 295; Nyl. Mon. Ramal. 51; Leight. Lich. Fl. G. B. 92.
FIG :—Ach. Act. Holm. 1797. t. 11. f. 3, A, B, E, F. K.
EXS :—Mudd 47; Leight. 73.
BOT. PROV :—1, 2...5, 6...10...15...26.
ENGLAND :—Roseberry Topping! Howden Gill! Cleveland. *Mr. Mudd.* Whitsuncliffe! near Thirsk, Yorkshire. *Mr. Baker.* Shanklin Church! Isle of Wight. *Rev. T. Salwey.* Bovisand. Plymouth! *Mr. Holmes.* Gulsal Carne, Penzance! *Mr. Curnow.* Caer Caradoc!, Shropshire.
SCOTLAND :—Coast of Kincardineshire (fruit). *Rev. J. M. Crombie.*
IRELAND :—Letterfrack Bay! River Dawros! co. Galway. *Mr. Larbalestier.*
WALES :—Llanbedrog! Pen Cow! Forthill! near Fishguard. Pembrokeshire.

Forma *emplecta*, Ach. *laciniæ* attenuate, *excessively branched*, acuminate and *granulate at the apices.*

On rocks.

SYN :—Ach. Syn. 295; Nyl. Mon. Ramal. 51.
FIG :—Ach. Act. Holm. 1797. t. 11. f. 3. C. P. Z.
GEOG. DISTRIB :—Sweden and W. France.
BOT. PROV :—15...31.
SCOTLAND :—Morrone and Braemar! *Rev. J. Crombie.*
CHANNEL ISLANDS :—The Warren! Noirmont, Jersey. *Mr. Larbalestier.*

Forma *depressa*, Cromb. *cæspitose*, laciniæ *short*, stunted, *adnate.*

On maritime rocks.

SYN :—Crombie in Journ. Bot. N. S. 1. 72.
BOT. PROV :—1. 2...15—31.
ENGLAND—Polperro and Tintagel, Cornwall; between Brighton and Portsdown (fruit). *Mr. Forster.*
SCOTLAND :—Coast of Kincardineshire. *Rev. J. M. Crombie.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

7. *R. pollinaria*, Ach. pale straw-colour or whitish, or albido-glaucescent, *densely cæspitose, membranaceo-laciniose; laciniæ short, dilated and compressed*, somewhat shining, sublacunose or lacunoso-corrugate, *flaccid, covered with broad white farinoso-sorediate, confluent patches*; cortical layer filamentose; medulla K—; apothecia marginal and terminal; *receptacle unequal*; *spores* 8, colourless, oblong, *straight or gibbous*, 1-septate; spermogonia in pale colourless receptacles.

On trees, palings, rocks, &c., rare in fruit.

SYN:—*R. pollinaria*, Ach. Syn. 298; Nyl. Mon. Ramal. 52; Leight. Not. Lich. 35; Crombie l. c. 73.
GEOG. DISTRIB :—Europe, Africa.
"Spores .010—15 mm. long, .004—6 mm. broad." (*Nyl.*)

Forma *elatior*, Ach. *laciniæ suberect, elongate*, plane, *sublinear*, attenuate and albo-pulverulento-*sorediate at the apices.*

FIG :—Ach. Act. Holm. 1797, t. 11. f. 2. A, B, C, F.
EXS :—Schær. 393; Hepp. 564. 565; M. & N. 546. Reich. & Schub. 66.
BOT PROV :—1, 2...4, 5.
ENGLAND :—Near Hastings (fruit). *Rev. J. M. Crombie.* Plymouth! *Mr. Holmes.*. near Ida, Devon. *Mr. Jacob.* Beeding! Suffolk. *Rev. A. Bloxam.* Barnsley Park, near Cirencester. *Mr. W. Joshua.* Haughmond Hill! Shropshire.

Forma *humilis*, Ach. *membranaceo-dilated, laciniose*, with *broad confluent*, powdery white *soredia.*

FIG :—Ach. Act. Holm. 1797, t. 11. f. 2, D.
EXS :—Mudd 46, in part.
BOT. PROV :—1...3...10
ENGLAND :—Ingleby!, Cleveland. *Mr. Mudd.* Walthamstow, Essex. *Mr. Forster.* Tunbridge Wells. *Rev. J. M. Crombie.* Penzance. *Mr. Curnow.*
If the soredia of *R. pollinaria* be wetted with K it immediately sinks just like water would do, but producing no reaction either on them or on the thallus.

8. *R. evernioides*, Nyl. pale straw-colour or whitish, *membranaceous, dilated and compressed, flaccid, subopake*, frequently *reticulato-rugose or reticulato-scrobiculate*, or slightly rugulose, or here and there plane, variously laciniate, laciniæ difformed *with broad white farinoso-sorediate confluent patches or denudations of the cortical layer;* cortical layer thin, amorphous; medulla K—; "apothecia pallido-testacea vel pallido-glaucescentia; receptaculum subtus rugosum"; spermogonia in pale colourless receptacles.

On trees, palings, &c., rare in fruit.

SYN :—Nyl. Prodr. Gall. Alger. 47; Nyl. Mon. Ramal. 55; Crombie, l. c. 73.
FIG:—Ach. Act. Holm. 1797, t, 11, f. 2, E. E. Bot. 1607! Dill. Musc. t. 21, f. 57, C. D.
EXS :—Mudd 46 in part. Leight. 41.
GEOG. DISTRIB :—Europe, Asia, Africa.
BOT. PROV :—1, 2...4, 5...8...10...30.
ENGLAND :—Testwood Park, New Forest (fruit). *Mr. Lyell.* near Lyndhurst, New Forest! (fruit) *Rev. J. M. Crombie.* (1866); Gopsall; Leicestershire. (fruit). Beeding! Suffolk. *Rev. A. Bloxam.* The Lizard. *Mr. Curnow.* Ingleby! Cleveland. *Mr. Mudd.* Stoke Wood! Exeter. *Mr. Parfitt.* Isle of Wight. *Rev. T. Salwey.* Haughmond Hill! Shropshire.
IRELAND :—Near Belfast. *Dr. Taylor.*
Probably common in Great Britain but confounded with *R. pollinaria.* If the soredia of *R. evernioides* be touched with K they are unaffected, but if immediately afterwards they are wetted with C, it sinks immediately just as water would do, but producing no reaction of colour either on them or on the thallus, thus distinguishing it from all states of *R. pollinaria.*
A parasite occasionally on the thallus.
"Spores .010—15 mm. long, .0035—.0045 mm. broad." (*Nyl.*)

f. *monophylla*, Cromb. thallus consisting of a single large rounded lobe.

On trees.

SYN :—Crombie l. c. 73.
ENGLAND :—Lyndhurst. *Rev. J. M. Crombie.*

9. *R. scopulorum*, (Dicks.) pale straw-colour, rigid, cartilaginous, *shining; laciniæ elongate, linear, subtereti-compressed*, simple, or branched at the apex, attenuate; cortical layer solid, external portion amorphous, internal portion filamentose; *medulla* K *yellow*,

*then ferruginous-red;* apothecia marginal and subterminal; *receptacle nearly smooth;* spores 8, colourless, oblong, straight, 1-septate; spermogonia in pale colourless receptacles, sometimes nigricant.

On maritime rocks, rare.

SYN :—*Lichen scopulorum*, Dicks. Crypt. Brit. 3. 18. *R. scopulorum*, Ach. L. U. 604, Syn. 297; Nyl. Mon. Ramal. 58. Leight. Not. Lich. 35; Crombie, l. c. 74.
FIG :—E. Bot. 688; Nyl. Syn. t. 8. f. 29.
EXS :—Larbal. 13; Bohl. 112.
GEOG. DISTRIB :—Europe, Africa.
BOT. PROV :—1, 2 ..6...16...31.
ENGLAND :—Lamorna Cove, Cornwall. *Mr. Knapp.* Land's End. *Messrs. Turner & Sowerby.* South Coast of England. *Mr. Forster.* Leigh Tor, Devon. *Dr. Holl.* Hightor Rocks, Devon. *Mssrs. Jones and Kingston.*
SCOTLAND :—*Mr. Dickson* (l. c.). Isle of Arran. *Mr. Lyle.* Kincardineshire and Orkney. *Rev. J. M. Crombie.* Isle of May. Firth of Forth. *Mr. Sadler.*
IRELAND :—Ardglass, Down. *Mr. Lyle.*
WALES :—Aberystwith. *Mr. Forster.* Harlech Castle!
CHANNEL ISLANDS :—Grosnez Common, Jersey! *Mr. Larbalestier.*
"Spores .012—19 mm. long, .0045—.0065 mm. broad." (*Nyl.*)

Var. *subfarinacea*, Nyl. M.S. very similar in general external appearance to *R. farinacea*, but the soredia and medulla K yellow then ferruginous-red.

On subalpine and maritime rocks, not common.

SYN :—Crombie l. c. 74.
EXS :—Nyl. Pyr. or. 24.
BOT. PROV :—1, 2...5...7...10...15...31.
ENGLAND :—Lanbraugh, Cleveland, Yorkshire! *Mr. Mudd.* Blackingston Rocks! Devon. *Mr. Parfitt*, Malvern Hills. *Dr. Holl.* Plymouth! *Mr. Holmes.* Ardingley, Sussex. *Mr. W. Joshua.* Penzance. *Mr. Curnow.* Longmynd! Shropshire.
SCOTLAND :—Portlethen, Kincardineshire. Craig Tulloch. *Rev. J. M. Crombie.* Kinnoul Hill, Perth. *Dr. Lindsay.*
WALES :—Beddgelert! Towyn! Harlech Castle! Moel-y-Golfa!
CHANNEL ISLANDS :—La Coupe, Jersey! *Mr. Larbalestier.* Scilly Islands. *Mr. Curnow.*

Var. *incrassata*, Nyl. thallus *thick, rigid, tuberculoso-difformate*, shortly laciniate, sparsingly divided, opake; external cortical layer amorphous, internally filamentose; medulla K yellow then reddish.

On maritime rocks, rare. 1873.

SYN :—Nyl. Ramal. p. 59. (1870.)
GEOG. DISTRIB :—West France and Canaries.
BOT. PROV :—7...31.
WALES :—Harlech Castle!
CHANNEL ISLANDS :—La Moye! Mont Orgueil Castle, Jersey! *Mr. Larbalestier* (1873).
In general appearance like R. polymorpha, Leight. Exs. 73, but smaller, and distinguished by different structure of the cortical layer and chemical reaction of the medulla.

10. *R. cuspidata*, (Ach.). pale straw-colour, rigid, cartilaginous, *shining; laciniæ elongate, linear, compressed, more or less longitudinally striato-nervose, lacunose and sorediato-tuberculate, simple or dichotomously branched;* cortical layer solid, external portion amorphous, internal portion filamentose; *medulla* K—; apothecia marginal and subterminal; *receptacle smooth; spores* 8, colourless, oblong, *straight*, 1-septate; spermogonia in pale colourless receptacles.

On maritime rocks, frequent.

Dr. Nylander (l. c.) remarks :—"Forsan non vere specie differat a *R. scopulorum*, tamen præsertim ob reactionem kalicam deficientem, seorsim hic est exponenda."

SYN :—*R. scopulorum* var. *cuspidata*, Ach. L. U. 605, Syn. 297. *R. scopulorum*, Leight. Not. Lich. 35 ; *R. cuspidata*, Nyl. Mon. Ramal. 60. Crombie. l. c. 74.

FIG :—Ach. Act. Holm. 1797. t. 9. f. 2. B ; Dill. t. 17. f. 38. B.

EXS :—Th. M. Fries. 1 ; Anzi Ital. Sup. 69 ; Schær. 554 ; Hepp 837 ; Leight. 2 ; Rabh. 864.

GEOG. DISTRIB :—Europe, Asia, Africa, North America.

BOT. PROV :—1...6, 7...10...15.

ENGLAND :—Yorkshire !, *Mr. Dixon*. Blackingstone Rocks ! Lustleigh Cove ! Babicombe ! Devon. *Mr. Parfitt*. Membury, Devon, *Dr. Holl*. Bovisand, Plymouth ! *Mr. Holmes*.

SCOTLAND :—Kincardineshire ! *Rev. J. M. Crombie*.

WALES :—Near Aberystwith. *Mr. Forster*. Bardsey Island, Carnarvonshire ! *Mr. Johnston*. South Stacks ! Holyhead. Gimlet Rock ! Pwllheli. Manorbeer ! near Tenby.

The specimens from the South Stacks had the laciniæ small, subulate, subsimple, erect, with blackish apices bearing the apothecia.

"Spores .010—18 mm. long, .004—6 mm. broad." *(Nyl.)*

Var. *crassa*, Del. thick, rigid, tuberculoso-difformed.

CHANNEL ISLANDS :—Rocks under Vale Castle, Guernsey ! *Mr. Larbalestier*.

11. *R. intermedia*, Del. very similar generally to R. *scopulorum var. subfarinacea*, Nyl. but the *apices* more *attenuated* and divided, *sorediate* on the edges, cortical layer filamentose ; *medulla K—, soredia K yellow then red ;* apothecia pale yellow, terminal, subtended by a longish divaricate extremity of the lacinia ; *receptacle smooth ; spores* 8, colourless, ellipsoid or oblongo-ellipsoid, *straight*, 1-septate.

On heaths and thorns, rare. 1872.

SYN :—Nyl. Mon. Ramal. 68. (1870). Crombie in Journ. Bot. n. s. 1. 133.

BOT. PROV :—1...26.

IRELAND :—Killery Bay, co. Galway. *Mr. Larbalestier*.

CHANNEL ISLANDS :—Newlyn Cliff, Penzance, and Annet Island ! Scilly. *Mr. Curnow*. (1872)

12. *R. Curnowii*, Cromb. *pale straw-colour, rigid*, cartilaginous, *slender, fruticulose, smooth* and shining, (K—C yellow, medulla K—) ; *laciniæ elongate*, roundish or somewhat compressed, sparingly dichotomously branched in the lower part, more copiously branched in the finely attenuated apices, slightly dilated at the bifurcations, *nigricant at the very base ; apothecia* pale, *convex, geniculato-adnate*, subtended by a short divaricate branch ; *receptacle smooth ;* spores 8, colourless, ellipsoid, straight, 1-septate ; *spermogonia externally black.*

On maritime rocks, not unfrequent.

SYN :—Nyl. in Flora 1875 p. 441.

BOT. PROV :—1.

ENGLAND :—Near Penzance and the Lizard, near the Land's End, Cornwall. *Mr. Curnow*.

Resembling *R. cuspidata* but more copiously branched. About 8 centimetres high. "Spores .011—15 mm. long, .004—6 mm. broad. Spermatia .003 mm. long, .001 mm. broad." *(Nyl.)*

13. *R. geniculata*, Tayl. *pallid or pale straw-colour*, cæspitose, *subfastigiato-ramose*, subterete or sub-compressed, smooth or obsoletely longitudinally subnervose, *often perforated with minute round holes*, internally fistulose, branches attenuate ; apothecia pallido-testa-

ceous or glauco-whitish, terminal or subterminal; receptacle smooth or rugulose, *sessile on a turgid branch, or appendiculate;* spores oblong or fusiformi-oblong, straight or obsoletely curved.

On old thorn bushes, rare. 1876.

SYN:—Hook. and Tayl. in Lond. Journ. Bot. 3. 655. (1854) Nyl. Mon. Ramal. 65.

GEOG. DISTRIB:—Australia, New Zealand, S. America, Nova Granada, Africa.

BOT. PROV:—26.

IRELAND:—Killery Bay, co. Galway. *Mr. Larbalestier.* (1876).

"Spores .009—.015 mm. long, .004—7 mm. broad." *(Nyl.)*

## TRIBE X. CETRARIEI.

Thallus compressed, rarely terete, variously fruticulose, or narrower, or frondose, membranaceous, dilatate or lobate, epithallus somewhat shining, internally filled with a white woolly medulla. Apothecia lecanorine, marginal. Spores 8, small, colourless, simple. Paraphyses indistinct. Spermogonia marginal, in setuliform apiculi, or black papillæ.

### I. CETRARIA. *Ach. pr. p. Nyl.*

Thallus spadiceous or spadiceo-pallescent, rigescent, erect or ascending, laciniose, rarely fistulose, somewhat shining. Apothecia dull or bright brown. Spermatia cylindrical.

1. *C. islandica*, (L.) pale or pale chesnut-brown or fuscescent, *laciniæ broad, variously divided, frequently subcanaliculate, margins spinuloso-ciliated, with impressed white soredia on the back;* apothecia brown, large, *adnate to the upper surface of the apices of the laciniæ,* receptacle entire or crenulate.

On the ground in sub-alpine places, rare. 1794.

F. 1. *platyna*, Ach. laciniæ *platyphyllous,* margins spinuloso-ciliated.

SYN:—Ach. Syn. 229. (1817). Nyl. Scand. 79. Syn. 208. Mudd Man. 77.

FIG:—E. Bot. 133. Nyl. Syn. t. 8. f. 32.

EXS:—Schær. 22. Mudd 51. Leight. 42. Anzi It. S. 48. Mass. 102. Fellm. 58. Hepp 169.

GEOG. DISTRIB:—Frigid and Alpine Europe, N. America, Himalaya.

BOT. PROV:—4...7, 8...10, 11...13, 14, 15...18, 19, 20.

ENGLAND:—Durham. *Rev. J. Harriman.* Murton Craigs; Belford; Lamberton Moor, Berwick-on-Tweed. *Dr. G. Johnston.* Flarendale and on Seamer Moor, near Scarborough, Yorkshire. *Mr. Baker.* Terrington; Stockton; Earsley Moors, Yorkshire. *Mr. Teesdale.* (1794). Ingleborough; Gregareth, Yorkshire. *Dr. Windsor.* Gateshead, Whickham, and Muggleswick Fells; Teesdale and Weardale, Durham; Cheviot; Hedgehope; Simonside; Wallington Moors, Northumberland. *Mr. Winch.* King's Lynn! Norfolk. *Mr. Plowright.* Market Rasen! Lincolnshire. *Dr. F. A. Lees.*

SCOTLAND:—Pentland Hills, near Edinburgh; Ben Lomond. *Sir J. E. Smith.* Ben-na-Boord, Aberdeenshire; King's Park; Corstorphine; Dalmahoy. *Dr. Greville.* Morne near Castleton, Braemar. *Prof. Graham.* Sidlaw Hills; Clova Mountains! Forfarshire. *Mr. W. Gardiner.* Long Island. *Prof. Balfour.* Hartfell, Moffat. *Dr. Nichol.* Morchone, Braemar. *Mr. Croall.* Ben Macdhui! Braemar. *Mr. Baker.* Loch-na-Garr! *Rev. T. B. Bell.* Muirhall, Perth. *Dr. Lindsay.* Grampians. *Rev. J. M. Crombie.*

IRELAND:—Summit of Mangerton. *Dr. Taylor.* Devil's Ladder, Carrantuel, Mc Gillicuddy's Reeks. *Mr. Hardy.*

WALES :—Cader Idris. *Rev. T. Salwey.*
"Spores .002 to .0025 in. long, by .001 in. broad." (*Mudd*). "Spores .007—011 mm. long, .005—6 mm. broad." *(Nyl).* "Spores .007—11 mm. long, .004—6 mm. broad." *(T. M. Fr.)*

F. 2. *crispa*, Ach. laciniæ *stenophyllous*, intricate, erect or depressed, canaliculate or with margins *connivent or interruptedly tubulose*, margins spinuloso-ciliated.

SYN :—Ach. L. U. 513. (1810).
FIG :—Dill. t. 28. f. 112.
EXS :—Schær. 23. Mudd 52. Tuck. 3. Anzi Langob. 21. It. S. 49. Fellm. 59. Hepp 170.
GEOG. DISTRIB :—Northern Europe and Cape Horn.
BOT. PROV :—7...9...11...15.
ENGLAND :—Widdy Bank, Teesdale, Durham, *Mr. Mudd.* Bidstone Hill! Cheshire, *Rev. H. H. Higgins.*
SCOTLAND :—Ben Lawers! Ben Mc Dhui; *Dr. Lindsay.* Top of Ben Nevis! *Rev. T. B. Bell.*
WALES :—Moel Goch, Cwm Cywion!
Mr. Plowright has sent me specimens gathered by himself at North Wootton Common, Norfolk, where he states the lichen is abundant, and that North Wootton Church, which is exactly intermediate between the Common and the Sea, is only 33 feet above the level of the sea.

2. *C. Delisei*, (Schær.) pale or chesnut-brown, densely cæspitose, *laciniæ narrow, elongate, canaliculate, palmato-multifid, recurved*, apices spinulose ($K = \overline{C+}$ slightly red); apothecia brown, large, subterminal.

On alpine rocks, very rare. 1869.

SYN :—Schær. Enum. 16 (1850). Nyl. Scand. 79.
FIG :—Westr. Faergh. t. 16. c.
EXS :—Fellm. 60. Th. M. Fries. 54, Rabh. 919.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Summit of Lochnagar in Braemar. *Rev. J. M. Crombie.*

3. *C. aculeata*, Fr. spadiceous, fistulose, *terete or compressed* or angular, rigid, erect, ramose, *cæspitoso-fruticulose*, branches *divaricate*, more or less nigro-spinulose; apothecia spadiceous, small, *terminal*.

On moors, heaths, rocks, &c., not uncommon.

"Spores .00175 to .002 in. long, by .00075 to .001 in. broad." *(Mudd.)* "Spores .006—9 mm. long, .0035—.004 mm. broad." *(Nyl.)* "Spores .005—9 mm. long, .003—4 mm. broad." *(T. M. Fr.)*

F. 1. *typica*, spadiceous, *plano-compressed, sublacunose, naked*, divaricato-spinulose at the apices.

SYN :—Ach. Meth. 302. (1803). Nyl. Syn. 300.
FIG :—Ach. Meth. t. 6. f. 2.
EXS :—Mudd 50. Leight. 3. Reich. & Schub. 21.
GEOG. DISTRIB :—North and Central Europe, Arctic America, Antarctic America.
BOT. PROV :—3...5...7, 8...10, 11...14, 15...19...26...30, 31.
ENGLAND :—Dirrington Law, Northumberland. *Dr. G. Johnston.* Craigforda, near Oswestry, Shropshire. *Rev. T. Salwey.* High Green Wood, Todmorden. *Mr. Baines.* Shipley Common, Yorkshire. *Mr. Hailstone.* Lyndhurst Moor. *Rev. J. M. Crombie.* Flazendale. *Mr. Baker.* Malham. *Dr. Carrington.* Ayton Moor; Farndale! Burton Head; and other places in Yorkshire. *Mr. Mudd.* Simonside; Prestwick Carr, Northumberland; Gateshead and Ravensworth Fells, Durham. *Mr. Winch.* Malvern Hills, Worcestershire. *Mr. Purton.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.* Tiptree Heath, Essex. *Mr. Varenne.* Sugar Loaf, Monmouthshire. *Mr. Purton.* Peart's Crags, near Settle.

*Dr. Windsor.* Swinnop Fell, Allendale, Northumberland. *Rev. W. Johnson.* Spout Valley, Long-Mynd! Pontesford Hill! Haughmond Hill! Stiperstones! Shropshire.

SCOTLAND :—Pentland Hills. *Dr. Greville.* Forfarshire. *Mr. W. Gardiner.* Glen Nevis! Invernesshire; Blaeberry Hill! Perth. *Dr. Lindsay.* Aberdeen Links; Grampians. *Rev. J. M. Crombie.* Isle of May, Firth of Forth. *Mr. Sadler.*

IRELAND :—Near Belfast. *Mr. Templeton.* Southern Counties. *Dr. Taylor.* near Maam! Joyce County. *Mr. Larbalestier.*

WALES :—Cwm Bychan, near Barmouth. *Rev. T. Salwey.* Arran Mowddy! Gwydir Rocks, Bettws-y-coed! (fruit).

CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier.*

F. 2. *muricata*, Ach. *smaller, densely intricato-cæspitose*, densely ramulose, *subterete*, or sub-compressed, *naked*, shortly divaricato-spinulose at the apices.

SYN :—Ach. Meth. 302. (1803). Nyl. Scand. 80.
FIG :—E. Bot. 452.
EXS :—M. & N. 756. Schær. 555. Welw. 8, Mudd 49. Leight. 4.
GEOG. DISTRIB :—Alpine Europe.
BOT. PROV :—1...5...7...10...14, 15.

ENGLAND :—Beverley. *Mr. Teesdale.* Ayton! Yorkshire *Mr. Mudd.* Craigforda! near Oswestry, *Rev. T. Salwey.* Malvern Hills; Stiperstones, Salop; Sugar Loaf, Monmouthshire. *Mr. Purton.* Dartmoor Tors, Devon. *Messrs. Jones and Kingston.* Stiperstones! Laurence Hill! Shropshire. Long Mynd! Haughmond Hill!

SCOTLAND :—Pentland Hills. *Dr. Greville.* Forfarshire. *Mr. W. Gardiner.* Ben Nevis! *Dr. Lindsay.* Glen Muick and Glen Dee, Braemar. *Rev. J. M. Crombie.*

WALES :—Barmouth! Cwm Cywion!

F. 3. *acanthella*, Ach. like *typica*, but entirely *hispido-spinuloso-denticulate.*

SYN:—Ach. L. U. 612. (1810).
FIG :—Hoffm. Pl. Lich. t. 5. f. 2.
EXS :—Schær. 254. pr. p. M. & N. 168. Zw. 222. Welw. 10. Anzi Langob. 416. b.
GEOG. DISTRIB :—Switzerland, Germany, Portugal, Italy.
BOT. PROV :—5...10...15.

ENGLAND :—Hambleton! Yorkshire. *Mr. Baker.* Ayton! Cleveland. *Mr. Mudd.* Clifton! Bristol. *Mr. Joshua.*

SCOTLAND :—Hill of Ardo, near Aberdeen. *Rev. J. M. Crombie.*

## II. PLATYSMA. *Hffm. pr. p. Nyl.*

Thallus various in colour, nigrescent, fruticulose, generally membranaceo-dilated, lobate or laciniate, nearly subterete. Apothecia marginal or sub-marginal. Spermogonia minutely papillate or tuberculate. Spermatia incrassate at both the obtuse apices, or fusiformi-incrassate at one apex, or fusiformi-ellipsoid.

A. *Spermatia incrassate at both the obtuse apices.*

1. *P. nivale*, (L.) ochroleucous or stramineous, *sinuato-laciniate*, laciniæ *canaliculato-patulous, reticulato-lacunose*, dentate at the *erect* apices (K—C+); apothecia flesh-coloured, margin of receptacle crenato-rugose; spores 8, colourless, oblong, small, simple.

On the ground in alpine places.

SYN :—Linn. Fl. Suec. 1086. Nyl. Syn. 302. Mudd Man. 78,
FIG :—E. Bot. 1994. Nyl. Syn. t. 8. f. 33. Hepp Sporen t. 96. f. 845.
EXS :—Schær. 19. Tuck. 59. Anzi It. S. 51. Hepp 845. Mudd 53. Leight. 43. Smrft. 76. Rabh. 865.
GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—15.

SCOTLAND :—Highlands. *Dr. Rob. Townson.* Cairngorm and Ben Lawers. *Sir W. J. Hooker.* Bassies; Ben Red; Loch Brandy; Clova; *Mr. W. Gardiner.* Source of the Dee; Lochnagar; Morchone; Braemar; *Dr. W. L. Lindsay.* Ben-na-Boord! Clova. *Rev. T. B. Bell.* Ben Mc Dhui. *Mr. J. G. Baker.*

"Spores .0015 to .002 in. long, by .00075 in. broad." (*Mudd.*) "Spores .007—9 mm. long, .004—5 mm. broad." (*Nyl.*) "Spores .006—9 mm. long, .003—5 mm. broad." (*T. M. Fr.*) Spores .0075 mm. long, .004 mm. broad.

2. *P. cucullatum*, (Bell.) ochroleucous or stramineous, *canaliculato-laciniate*, laciniæ *sinuato-divided*, margins *connivent*, *undulate*, *smooth*, crenate at the *recurved* apices (K—C+); apothecia flesh-coloured, adnate, often dilated, margin of receptacle thin, at length excluded; spores 8, colourless, oblong, simple, small.

On the ground in alpine localities.

SYN :—Bellard Obs. Bot. 54. (1788). Nyl. Syn. 302. Mudd Man. 78.

FIG :—Hoffm. Pl. L. t. 66. f. 2. Hepp Sporen t. 96. f. 844.

EXS :—M. & N. 544. Schær. 18. Tuck. 4. Mass. 297. Anzi It. S. 50. Hepp 844. Fellm. 61.

GEOG. DISTRIB :—Europe, N. America.

BOT. PROV :—15.

SCOTLAND :—Cairngorm Mountains. *Rev. J. Dalton.* Summit of Cairntoul, Braemar. *Rev. J. M. Crombie.*

"Spores .0015 to .002 in. long, by .00075 in. broad." (*Mudd.*) "Spores .007—.010 mm. long, .004 mm. broad." (*Nyl.*) "Spores .006—9 mm. long, .003—5 mm. broad." (*T. M. Fr.*) Spores .0075 mm. long, .0035 mm. broad.

3. *P. triste*, (Web.) *pitch-black*, browner below, *subfastigiato-fruticulose*, *teretiusculo-compressed*, *rigid*, *disticho-ramose*, branches black, attenuate, (medulla C—); apothecia fuscous-black, subterminal, appendiculate, margin dentate flexuose; spores 8, colourless, oblong, simple.

On alpine rocks, frequent.

SYN :—Weber Spicil, p. 209. (1778). Nyl. Syn. 307. Mudd Man. 76.

FIG :—E. Bot. 720. Web. Sp. t. 5. Hepp Sporen t. 96. f. 846.

EXS :—M. & N. 646. Welw. Lusit. 112. Hepp 846. Anzi It. S. 57. Schær. 256.

GEOG. DISTRIB :—Alps of Europe.

BOT. PROV :—1...5...7...10, 11...14, 15...18, 19.

ENGLAND :—Summit of Hedgehope, Northumberland. *Dr. G. Johnston.* Yorkshire! *Mr. Dixon.* Eglestone and Cronkley Fell, Durham. *Rev. J. Harriman.* Cheviot; Simonside; Northumberland. *Mr. Winch.* Malvern Hills, Worcestershire; Sugar Loaf, Monmouthshire. *Mr. Purton.* Tors of Dartmoor. *Mr. Newberry.*

SCOTLAND :—Clova Mountains. *Mr. W. Gardiner.* Morchone! and Glen Dee! Braemar and top of Lochnagar! and near Perth. Garrynahine, Lewis. *Dr. Lindsay.* Aberfeldy, Perthshire. *Mr. Macmillan.* Ben Lawers. *Dr. Holl.* Ben Wyvis. *Mr. Howie.*

IRELAND :—Higher Mountains, Kerry. *Dr. Taylor.*

WALES :—Cader Idris, Snowdon! *Rev. T. Salwey.* Moel Siabod. *Mr. W. Phillips.* Arran Mowddy! (fruit) Cwm Tryfaen! Glyder Fach! Cwm Ffynnon lloer!

"Spores .0015 to .00175 in. long, .001 to .00075 in. broad." (*Mudd.*) "Spores .009—.011 mm. long, .005—6 mm. broad." (*Nyl.*) "Spores .008—11 mm. long, .004—6 mm. broad." (*T. M. Fr.*)

4. *P. sæpincola*, (Ehrh.) *castaneo-olivaceous* or *badio-castaneous* or pallido-castaneous, laciniato-lobate, *small*, laciniæ plane, prostrate or ascending, smooth, or slightly lacunose-rugulose, margin *undulato-sinuate or crenate*, paler beneath, (K—C—); apothecia *badio-fuscescent*, receptacle *rugulose beneath*, *margin entire;* spores ellipsoid.

On trees and palings, rare.

SYN :—Ehrhart Beitr. 2. p. 95. (1788). Nyl. Syn. 308. Crombie in Journ. n. s. l. p. 234. Mudd Man. 80.

FIG :—Hffm. Pl. L. t. 14. f. 1. E. Bot. t. 2386. fig. 1. and 2. and lower right hand figure. Hepp Sporen t. 96. f. 843.

EXS :—Schær. 297. Hepp 843. Rabh. 741. Fellm. 63. Leight. 45. Smrft. 152.

GEOG. DISTRIB :—N. Europe, N. Asia, Arctic America.

BOT. PROV :—1...5...7, 8...10, 11...15...18...31.

ENGLAND :—Yarmouth. *Mr. D. Turner.* Oteley Park pales, near Ellesmere, Shropshire. *Rev. T. Salwey.* Ingleby Park; Baysdale; Kildale; and High Cliff, Cleveland. *Mr. Mudd.* near High Force Inn, Teesdale. *Dr. Holl.* Bardon Hill; Gopsall, Leicestershire. *Rev. A. Bloxam.*

SCOTLAND :—Deerhill Wood; White Hill; Forfarshire, *Mr. W. Gardiner.* Kinnordy. *Mr. Lyell.* Morchone! Braemar; Blaeberry Hill, Perth; Garrynahine, Lewis. *Dr. Lindsay.* Quoich, Braemar; Killin; Blair Athole, *Rev. J. M. Crombie.*

WALES :—Cwm Bychan; Cessel Cwm; Drws Ardudwy. *Rev. T. Salwey.* Giant's Pebbles, Cader Idris. *Mr. Ralfs.*

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

"Spores .0175 in. long, by .001 in. broad." (*Mudd.*) "Spores .008—.010 mm. long, .0055—.0065 mm. broad." (*Nyl.*) "Spores .006—10 mm. long, .004—6 mm. broad." (*T. M. Fr.*)

Var. *ulophylla*, Ach. *paler and larger* than *sæpincola;* laciniate, laciniæ variously divided, sub-adpressed, *margin undulato-crisped, albo-sorediate*, (K—C—); apothecia small.

On trees, palings, &c., frequent, but rare in fruit.

SYN :—Ach. Meth. 297. (1803). Nyl. Syn. 309. Crombie, l. c.

FIG :—E. Bot. 2386. fig. 3. and lower left hand figure.

EXS :—Anzi It. S. 54. Rabh. 742. Mudd 56.

BOT. PROV :—4, 5...7...10...15.

ENGLAND :—Ingleby Park! Kildale! Cleveland. *Mr. Mudd.* Oteley Park pales!, Ellesmere, Shropshire. *Rev. T. Salwey.* Stiperstones! Shropshire.

SCOTLAND :—Kinnordy, Forfarshire. *Sir. W. J. Hooker.* Blaeberry Hill! Perth. *Dr. Lindsay.* Scotch Mountains. *Mr. Dickson.* Linn of Quoich, Braemar; Grampians. *Rev. J. M. Crombie.*

WALES :—Conway falls! Cwm Bychan!

5. *P. Fahlunense*, (L.) fuscous or spadiceo-fuscous or fusco-nigricant, *orbicular*, smooth, *lobato-laciniate, laciniæ appressed, plano-subcanaliculate, margins elevated, apices rotundato-crenate*, beneath nigricant, (K medulla yellow); apothecia fuscous or fusco-rufous, receptacle plicato-rugose, margin granulose; spores 8, colourless, oblong, simple, small; spermatia slender, elongate, straight incrassate at each apex.

On alpine rocks, rare.

Attention to the margins of the thallus and spermatia will always distinguish this from *P. commixtum*, Nyl.

SYN :—Linn. Fl. Suec. 1078. Nyl. Syn. 309. Mudd Man. 100.

FIG :—Hoffm. Pl. L. t. 36. f. 2. Hepp Sporen t. 67. f. 586.

EXS :—Hepp 586. Schær. 373. 374. Fr. L. S. 336. Anzi It. S. 55. 56.

GEOG. DISTRIB :—Arctic Europe, N. America, Himalaya.

BOT. PROV :—1...7...10, 11...15.

ENGLAND :—Yorkshire! *Mr. Dixon.* Teesdale; Weardale: Butsfield; Horsleyhope, Durham; Cheviot, Northumberland. *Mr. Winch.* Hay Tor, Dartmoor. *Dr. Holl.*

SCOTLAND :—Clova Mountains. *Mr. W. Gardiner.* Grampians, Braemar; Ben More, Bredalbane. *Rev. J. M. Crombie.* Ben Lawers. *Dr. Holl.*

WALES :—Llyn Cae, Cader Idris. *Rev. T. Salwey.*

"Spores .008—.011 mm. long, .005—7 mm. broad." (*Nyl.*) "Spores .005—.011 mm. long, .004—6 mm. broad." (*T. M. Fr.*) Spores .008 mm. long, .0055 mm. broad.

6. *P. diffusum*, (Web.) *whitish or albido-cinerascent*, stellato-orbicular, appressed, laciniæ narrow, applanate, multifid, *albo-*

*sorediate;* apothecia spadiceo-fuscous or rufescent, margin crenulate, sorediate; spores 8, colourless, oblong or oblongo-ovoid, simple, straight; thallus K + C—, medulla K yellow.

On posts, palings, &c. not uncommon. 1793.

SYN:—Web. Spic. 250. (1778). *P. aleurites*, Ach. Prodr. 117. (1798). Syn. 208. Nyl. Scand. 105. Mudd Man. 98. *Parm. placorodia*, Ach. Syn. 196. Nyl. Scand. 106.

FIG:—E. Bot. 858. Dicks. Cr. Br. t. 9. f. 6. Hffm. Pl. t. 65. f. 2. Hepp Sporen t. 98. 859.

EXS:—Zw. 54. Schær. 489. 376. M. and N. 739. Mudd 71. Hepp 859. Anzi Langob. 50.

GEOG. DISTRIB:—Denmark, Sweden, Finland, Switzerland, Italy, Bavaria, Germany.

BOT. PROV:—3, 4, 5...8...10...15.

ENGLAND:—Croft Castle Park, Herefordshire. *Mr. Dickson.* (1793). Henham, Suffolk. *Mr. D. Turner.* near Windsor. *Dr. G. H. Noehden.* Oswestry! Hay Park near Ludlow; Oteley Park near Ellesmere. *Rev. T. Salwey.* Rosedale; Farndale; Bransdale; Baysdale! Kildale; Ingleby Park, Yorkshire. *Mr. Mudd.* Gopsall, Leicestershire. *Rev. A. Bloxam.* Haughmond Hill! Shropshire, very fine and abundant.

SCOTLAND:—Scotch Highlands, *Rev. J. Dalton.*

"Spores .0015 in. long, by .00075 in. broad." (*Mudd.*) "Spores .011—12 mm. long, .003—4 mm. broad." (*Nyl.*) "Spores .006—9 mm. long, .005—6 mm. broad." (*T. M. Fr.*)

B. *Spermatia ellipsoid.*

7. *P. commixtum*, Nyl. pallido-spadiceous or spadiceo-fuscous, *effuse*, smooth, *irregularly lineari-laciniate* or divided, *laciniæ plane ascending and entangled, margins not elevated, apices obliquely truncate and furcate*, concolorous or paler beneath, (K medulla—); apothecia fuscous or fusco-rufous, receptacle plicato-rugose, margin granulose; spores 8, colourless, oblong, simple, small; spermatia short, oblongo-ellipsoid or fusiform-ellipsoid.

On alpine rocks.

Attention to the form of the apices of the imbricate laciniæ of the thallus, and the spermatia, will at once separate this from *P. Fahlunense.*

SYN:—Nyl. Syn. 310. (1858). Crombie in Journ. Bot. n. s. l. p. 234.

FIG:—Nyl. Syn. t. 8. f. 43. E. Bot. t. 653.

EXS:—Dicks. 23. M. and N. 350. Anzi Langob. 417. Zw. 184.

GEOG. DISTRIB:—Central Europe and Scandinavia.

BOT. PROV:—7...9...15.

ENGLAND:—Lancashire. *Mr Hudson.*

SCOTLAND:—Scotch Mountains! *Mr. Dickson.* Ben More; Ben-na-boord; Ben Lawers; *Rev. J. M. Crombie.* Loch-na-gar! Braemar. *Dr. W. L. Lindsay.* Rocks north side of Ben Lawers! *Mr. Carroll.*

WALES:—North Wales. *Mr. Griffith.*

"Spores .009—.011 mm. long, .004—5 mm. broad." (*Nyl.*) Spores .009 mm. long, .005 mm. broad.

C. *Spermatia acicular cylindrical, incrassate at one apex.*

8. *P. juniperinum*, (L.) *citrino-flavescent* or pale flavo-virescent or glauco-flavescent, lobato-laciniate, *laciniæ eroso-crenate, crowded, crisped*, smoothish, beneath yellow, rugulose, medulla citrine (K—C+); apothecia badio-rufous or badio-fuscous, margin corrugate or crenulato-denticulate; spores 8, colourless, oblongo-ellipsoid, simple.

On the earth and trees, in alpine districts.

SYN:—Linn. Fl Suec. 1093 Nyl. Syn. 312. Mudd Man. 79.

FIG :—Hoffm. Pl. L. t. 7. f. 2. Nyl. Syn. t. 8. f. 34. Hepp Sporen t. 95. f. 840.

EXS :—Schær. 20. Anzi It. S. 52. Langob. 371. Smrft. 153. Rabh. 866.

GEOG. DISTRIB:—N. Europe, N. America.

BOT. PROV :—15.

SCOTLAND :—Clova. *Mr. R. Jacob.* near Ben Lawers; Rothiemurchus. *Rev. J. M. Crombie.*

"Spores .0015 in. long, by .00075 to .001 in. broad." (*Mudd.*) "Spores .006—7 mm. long, .004—.0045 mm. broad." (*Nyl.*) "Spores .006—8 mm. long, .004—6 mm. broad." (*T. M. Fr.*)

Var. *pinastri*, (Scop.) like the type, but laciniæ lobate, appressed and broader, *margins citrino-sorediate; spores subglobose.*

On trees.

SYN :—Scop. Fl. Carn. 1. 387. (1760). Nyl. Syn. 312. Mudd Man. 79.

FIG :—E. Bot. 2111. Hffm. Pl. L. t. 7. f. 1. Hepp. Sporen t. 96. f. 841. 842.

EXS :—Schær. 21. Fries 333. Hepp 841, 842. Anzi It. S. 53. Fellm. 62. M. & N. 451. Arn. 618.

GEOG. DISTRIB :—N. Europe, Scandinavia, Asia, N. America.

BOT. PROV :—1...4...11...15.

ENGLAND :—Framlingham, near Norwich. *Mr. D. Turner.* Teesdale, Durham. *Rev. J. Harriman.* Ravine of St. John, Cornwall. *Rev. T. Salwey.*

SCOTLAND :—North of Scotland ; Aviemore ! Kinnordy. *Sir W. J. Hooker.*

The specimen from which E. Bot. t. 211 was drawn was a foreign one from Linn. Herb. The few British specimens seen are either much smaller, or when larger, greenish-yellow, margins less regularly citrino-sorediate. A state of *Physcia parietina* was often confounded with *juniperinum* by earlier writers and even by some modern lichenists, see Crombie in Journ. Bot. n. s. 1. p. 234.

9. *P. glaucum*, (L.) *ivory-white or glaucescent or pallescent, membranaceous*, smooth or *slightly lacunoso-rugulose*, laciniate or laciniato-lobate, laciniæ ascending, margins sinuate or crenate, or lacerate, or sorediate, or minutely dissecto-fimbriate, *beneath rugose, fusco-nigricant or fuscous or pallescent or entirely albicant*, (K+C=); apothecia spadiceo-rufous, receptacle rugose beneath, margin thin, presently excluded.

On rocks and trees, common.

SYN :—Linn. Fl. Suec. 1094. Nyl. Syn. 313. Mudd Man. 79.

FIG :—E. Bot. 1606.

EXS :—Nyl. 28. Bohl. 79. Mudd 54. Arn. 527. Leight. 44. Anzi It. S. 58 in part.

GEOG. DISTRIB :—Europe, America, Asia.

BOT. PROV :—1...5...7,...10, 11, 12...14, 15, 16...18, 19, 20...31.

ENGLAND :—Lamberton Moor, Northumberland. *Dr. G. Johnston.* Craigforda, near Oswestry ! *Rev. T. Salwey.* Kielder and Deadwater Fell, Northumberland. *Prof. Balfour.* Kildale Moor ! Cleveland. *Mr. Mudd.* Castle Howard, Yorkshire, *Mr. Teesdale.* (1794). Malvern Hills, Worcestershire. *Mr. Purton.* Dartmoor. *Dr. Holl.* Charnwood Forest ; Gopsall. *Rev. A. Bloxam.* Lustleigh Cleve, Devon. *Mr. Parfitt.* Peart's Crags, near Settle. *Dr. Windsor.* Heddon-on-wall, Northumberland. *Mr. Winch.* Malvern Hills, *Mr. Purton.* Bottor Rock, Whiddon ; Gidleigh, High Tor; Widdecombe-in-the-Moor, Devon. *Messrs. Jones & Kingston.* Swinnop, East Allendale, Northumberland ; Foreshield Wood, Alston, Cumberland. *Rev. W. Johnson.* Aymestrey ! Herefordshire ; Stiperstones ! Wrekin ! Shropshire.

SCOTLAND :—Pentland Hills. *Dr. Greville.* Clova Mountains ; Deerhill Wood, Forfarshire. *Mr. W. Gardiner.* Long Island ; Arran. *Prof. Balfour.* Ben Mac Dhui !, Braemar ; Blaeberry Hill, Perth ; Amulree ! Perthshire. *Dr. Lindsay.* Killin ; Rothiemurchus. *Rev. J. M. Crombie.*

IRELAND :—Mangerton. *Dr. Taylor.* Carrickadrohid. *Mr. Carroll.*

WALES :—Near Barmouth. *Rev. T. Salwey.* Capel Curig ! Aran Mowddy !

CHANNEL ISLANDS :—Boulay Bay, Jersey. *Mr. Larbalestier.*

"Spores .00175 in. long, by .001 in. broad." (*Mudd.*) "Spores .006—7 mm. long, .0035—.0045 mm. broad." (*Nyl.*) "Spores .006—9 mm. long, .0035—50 mm. broad." (*T. M. Fr.*)

f. *sorediosa*, margins *sorediate*, fusco-nigricant and rugose beneath.

Exs :—Anzi It. S. 58. Schær. 252.
Localities :—High Cliff, Cleveland. *Mr. Mudd.* Foreshield Wood, Alston, Cumberland. *Rev. W. Johnson.* Blaeberry Hill, Perth! Ben Mac Dhui, Braemar! *Dr. W. L. Lindsay.*

f. *fallax*, (Web.) margins entire or sorediate, *entirely albicant beneath.*

Fig :—Hffm. Pl. L. t. 47. f. 1—3.
Localities.—Carlisle! *Mr. T. C. Heysham.* Inverary. *Sir W. J. Hooker.* Killin. *Rev. J. M. Crombie.* Blackston Rock, Devon. *Mr. Jacob.*

f. *coralloidea*, (Wallr.) margins *minutely lineari-dissecto-fimbriate*, pallescent or albicant beneath.

Fig :—E. Bot. 2373. Hffm. Pl. L. t. 46. f. 1—3. Hepp Sporen t. 66. f. 574. Schær. 253.
Exs :—Th. Fr. 30. M. and N. 156. Anzi Langob. 418. Hepp 574. Schær. 253.
Localities.—Devonshire. *Mr. Slater.* Carig Mountain, Ireland. *Dr. Taylor.* Baldovan Woods; Clova Mountains. *Mr. W. Gardiner.*

10. *P. lacunosum*, Nyl. whitish, membranaceous, *reticulato-lacunose, broadly laciniate* or lobato-laciniate, *laciniæ crenato-undulate and incised, rotundate at the apex*, beneath fusco-nigricant or fusco-pallescent or entirely whitish, (K+C—); apothecia spadiceous, receptacle rugulous beneath, margin thin entire.

On damp rocks, rare.

Syn :—Nyl. Syn. 314. (1858). *Cetraria*, Ach. Meth. 295.
Fig :—Ach. Meth. t. 5. f. 3.
Exs:—Tuck. 6. 61.
Geog. Distrib:—N. America, Norway.
Bot. Prov. :—15, 16.
Scotland :—Ben Lawers! Craig Cluny, Braemar. *Rev. J. M. Crombie.* Fort William, in Lochaber. *Adm. Jones.*
"Spores .006—8 mm. long, .004—5 mm. broad." (*Nyl.*)

## Series IV. PHYLLODEI.

Thallus foliaceous, depressed, lobate or variously laciniate or stellate, very rarely cæspitoso-intricate, medulla stuppeous. Apothecia either peltiform or lecanorine or lecideine and gyrose. Spores various. Paraphyses distinct or indistinct. Spermatia shortly acicular or slenderly cylindrical, straight, narrower in the middle.

### Tribe XI. PELTIGEREI.

Thallus frondose, dilatate, cortical layer deficient on the under surface. Apothecia peltiform, rotundate, reniform or oblong, marginal, adnate to the upper or lower surface or scattered on the upper surface of the thallus. Spores 8, colourless and fusiform in the marginal apothecia, fuscous and ellipsoid and bilocular in the scattered apothecia. Paraphyses stout, articulate.

#### Sub-tribe I. NEPHROMEI.

Apothecia adnate to the lower surface of the margin of the thallus. Spores 8, colourless or fuscescent, 3-septate.

## I. NEPHROMIUM. *Nyl.*

Thallus membranaceous, fragile, lurid, or glaucescent or fuscescent, cortical layer continuous on the lower surface, and nerveless. Apothecia adnate to the lower surface of margin of thallus. Spores 8, colourless or fuscescent, 3-septate. Granula gonima moniliform, dark cæruleo-virescent.

1. *N. lævigatum*, Ach. lurido-fuscescent, *orbicular*, rotundato-lobate, margins *sinuato-crenate*, *opake*, *scarcely shining above*, beneath pale glabrous and slightly rugulose (medulla white K—); apothecia fusco-rufous, margin of receptacle *crenulato-unequal*, back of receptacle *minutely depresso-granulate;* spores 8, fuscescent, fusiformi-oblong, 3-septate.

On trees, rocks, and stones, in shady alpine places.

SYN :—Ach. Syn. 242. (1817). Nyl. Syn. 320. Leight. in Ann. & Mag. Nat Hist. 4. ser. vol. 5. p. 37. Mudd Man. 81.
FIG :—Tul. Mem. Lich. t. 9. f. 18—23.
EXS :—Maudon 31. Smrft. 70.
GEOG. DISTRIB :—Throughout the world.
BOT. PROV :—1...3, 4...7...12...15...31.
ENGLAND :—Keswick !, Cumberland. *Mrs. Stanger.* S. Devon and Cornwall. *Dr. Holl.* Bagley wood, near Oxford. *Mr. Baxter.* Cambridgeshire. *Rev. R. Relhan.*
SCOTLAND :—Highlands ! *Baron Von Wulfen.* Blair Athole ! *Prof. Dickie.* Grampians. *Rev. J. M. Crombie.* Killin. *Dr. Holl.*
WALES :—Dolgelley. *Dr. Holl.*
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .004 to .0045 in. long, by .00125 in. broad." *(Mudd.)*

Var. *parile*, (Ach.) lurido-fuscescent, paler or fusco-nigricant and glabrous beneath, *margins crisped and cæsio-sorediate.* (medulla white K—).

SYN :—Ach. Prodr. 164. (1798). Nyl. Syn. 320. Leight. in Ann. and Mag Nat. Hist. l. c.
FIG :—E. Bot. 2360. Dill. Musc. t. 28. f. 105. B. & C.
EXS :—Nyl. Paris. 109. Anzi It. S. 88. Langob. 24. 253. & 254. A. M. & N. 838. Arn. 621.
GEOG. DISTRIB :—Europe, Chili.
BOT. PROV :—1...5...7...16...30.
ENGLAND :—Hennock, near Bovey Tracey, S. Devon ! *Dr. Holl.* Cound Moor, Shropshire. *Rev. Edw. Williams.* Heavitree, Exeter. *Mr. Parfitt.*
SCOTLAND :—Appin. *Rev. J. M. Crombie.*
IRELAND :—Near Glenarm, co. Antrim. *Dr. Moore.*
WALES :—Dolgelley. *Mr. Ralfs.* near Dolgelley ! *Dr. Holl.* Drwsynant !

Var. *subtomentellum*, Nyl. under surface of thallus obsoletely sub-tomentellose; *back of receptacle rugose or coriaceo-rugulose*, or slightly areolato-granulose or areolato-rugulose (medulla white K yellow).

On old ash trees.

SYN :—Nyl. Lapp. or. p. 116.
EXS :—Fellm. 67. Anzi Langob. 252. M. & N. 252 upper specimen.
GEOG. DISTRIB :—E. Lapland, Lombardy, Switzerland.
BOT. PROV :—7...15.
SCOTLAND :—Head of Loch Awe, Argyleshire. *Rev. J. M. Crombie.*
WALES :—Drwsynant !

2. *N. tomentosum*, Hffm. livid or livido-castaneous or lurido-fuscescent, lobate or laciniato-lobate, glabrous below, tomentose upwards, under surface *pale and villose, (medulla white K—);*

apothecia testaceo-rufous or rufo-fuscescent, margin protruded, annulari-tomentose, *crenulate; back of receptacle villose;* spores 8, colourless or fuscescent, fusiformi-oblong, 3-septate.

On trees and rocks, very rare.

SYN :—Hffm. Pl. Germ. 2. p. 108. Nyl. Syn. 319. Leight. l. c.
FIG :—Dill. Musc. t. 28. f. 105. A.
EXS :—Schær. 259. Zw. 179. in part M. & N. in part 252. Tuck. 13. Smrft. 69.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—1...15...26.
SCOTLAND :—Invercauld! *Mr. R. Brown.* (1792). Craig Cluny, in Braemar. *Rev. J. M. Crombie.*
ENGLAND :—Ilsington; North Bovey; Manaton; Chagford; Whiddon Park; Bottor Rock, &c., Devon. *Messrs. Jones & Kingston.*
IRELAND :—Derryclare Island, co. Galway. *Mr. Larbalastier.*

Var. *rameum*, Schær. glaucescent, broadly lobate, under surface pale and villose, albido-papillate, pseudo-cyphellate.

On trees.

SYN :—Schær. Enum. 18. (1850). Nyl. Syn. 319. Leight. l. c.
EXS :—Schær. 508. Anzi 87.
GEOG. DISTRIB :—Switzerland, Hungary, Italy, Sweden.
BOT. PROV :—15.
SCOTLAND :—Forfarshire! *Mr. Dickson.*

3. *N. lusitanicum*, Schær. livido-castaneo-fuscescent, *rotundato-lobate*, margins *crenate*, not unfrequently minutely crenulate, crisped and undulate, *smooth and somewhat shining above*, beneath pale, glabrous and somewhat rugulose, *(medulla flavescent, K red);* apothecia fusco-rufous, margin of receptacle *crenato-laciniate incurved*, back of receptacle *minutely depresso-areolate;* spores 8, fuscescent, fusiformi-oblong, 3-septate.

On mossy rocks, trees, and stones, frequent.

SYN :—Schær. Enum. (1850). Leight. l. c.
FIG :—E. Bot. t. 305.
EXS :—Mudd 57. Arn. 479. Leight. 107. Nyl. Pyr. or. 26.
GEOG. DISTRIB :—Switzerland, Pyrenees, Portugal, Italy, Canaries, Java.
BOT. PROV :—1...3...5, 6, 7...10, 11, 12...15, 16...22.
ENGLAND :—Baysdale! Oggeray Gill! Cleveland. *Mr. Mudd.* Cumberland! *Mrs. Stanger.* Pentregaer! near Oswestry. *Rev. T. Salwey.* Torquay! Devon. *Dr. Deakin.* near Launceston! Cornwall; Ashburton! near Totness, Devon. *Dr. Holl.* Bickley! Devon; Liskeard! Cornwall; *Mr. D. Turner.* Shipley Wood, Eglestone, Durham. *Mr. Robertson.* near Hastings, Sussex. *Rev. E. N. Bloomfield.* Sussex coast, *Dillenius.*
SCOTLAND :—Carse of Ardessier, 3 m. east from Fort George! near Cawdor! Reeky Linn! Craig Koynoch! *Mr. W. Gardiner.* Crinan! Argyleshire. *Dr. Lindsay.* Falls of Moness, Aberfeldy! *Dr. Holl.* Braemar! *Mr. Croall.* Appin. *Rev. J. M. Crombie.* Dumbarton Castle. *Sir J. E. Smith.*
IRELAND :—Shore of Lough Tay; Luggelaw! *Adm. Jones.* Glenarm, co. Antrim. *Prof. Dickie.*
WALES :—Garthewin. *Mr. Griffith.* Dolgelley! Barmouth! Drwsynant! Glyn! near Capel Curig. Gwydir woods! Bettws-y-coed. Trefriw! Manorowen! near Fishguard, Pembrokeshire. Tremadoc!

Var. *Hibernicum*, Nyl. medulla white, K red; back of receptacle smooth.

On rocks rare.

EXS :—Anzi Etr. 8.
IRELAND :—Doughruagh Mountain! *Mr. Larbalestier.*

## SUB-TRIBE II. PELTIDEI.

Stratum gonidiale formed of granula gonima, not gonidia. Apothecia marginal on the upper surface of thallus. Spores 8, colourless or slightly fuscescent, fusiform.

### II. PELTIGERA. *(Hffm.) Ach.*

Thallus membranaceo-lobate, fragile, cortical layer not continuous on the under surface and there generally nerved and rhizinose. Apothecia marginal on upper surface of thallus. Spores 8, colourless or slightly fuscescent, fusiform, 3-5-7-septate. Stratum gonidiale of granula gonima not gonidia.

#### A. *Apothecia adnate.*

1. *P. aphthosa*, (L.) *glauco-virescent* or livido-glaucescent, broadly membranaceous, smooth, *with pale brown patelliform or verrucose depressed cephalodia*, beneath either reticulato-nigricanti-nervose, or continuously fusco-nigricant, with broad whitish margin; apothecia fusco-rufescent, rotundate, adnate to a narrow ascending thalline lobe; spores 8, colourless or fuscescent, fusiform, 3-7-septate.

On shady alpine rocks.

SYN :—Linn. Fl. Suec. 1098. Nyl. Syn. 322. Mudd Man. 81.
FIG :—E. Bot. 1119. Nyl. Syn. t. 8. f. 38. Hepp Sporen t. 19. f. 173.
EXS :—Tuck. 9. 102. M. & N. 251. Mudd 58. Mass. 12. Anzi It. S. 90. Hepp 173. Schær. 29.
GEOG. DISTRIB :—N. Europe, N. Asia, N. America.
BOT. PROV :—5...7, 8...10, 11...14, 15...26...30.
ENGLAND :—Craigforda; and Downton Castle, Herefordshire. *Rev. T. Salwey.* Cheviots, above Langley Ford; Gunnerton Crags; Shewing Shields, Northumberland; Hagerag Wood in Teesdale Forest, Durham. *Mr. Winch.* Holwick. *Rev. J. Harriman.* near Buxton. *Dr. Holl.* Ilsington; Lustleigh, &c. Devon. *Messrs. Jones and Kingston.* Swinnop, Allendale, Northumberland; Foreshield, Alston, Cumberland. *Rev. W. Johnson.*
SCOTLAND :—Foot of Pentland Hills. *Mr. Yaldon.* near the Falls of the Clyde, in fruit. *Messrs. Turner & Hooker.* near Habbie's How, in the Pentland Hills. *Dr. Greville.* Abbey St. Bathans! *Dr. G. Johnstone.* Sands of Barrie and west side of the White Hill, Forfarshire, in fruit. *Mr. W. Gardiner.* Banks of the Garry. Blair Athole. *Rev. J. M. Crombie.*
WALES :—Llyn Bodlyn; Breidden. *Rev. T. Salwey.* Eglwyseg Rocks!
IRELAND :—Sallagh Braes, near Belfast. *Mr. Templeton.* co. of Derry. *Mr. D. Moore.* Twelve Pins! Connemara. *Mr. Larbalestier.*
"Spores .009 to .012 in. long, by .00075 in. broad." *(Mudd.)* "Spores .060—92 mm. long, .005—6 mm. broad." *(Nyl.)*

2. *P. canina*, (L.) *canescent* or cinereo-pallescent, opake, more or less *longitudinally lacunoso-impressed, adpresso-tomentellose*, rotundato-lobate, *under surface* longitudinally appresso-albo-tomentose with *prominent pale anastomosing villoso-tomentose nerves extending to the very margin and clothed with tufts of pale rhizinæ;* apothecia fuscous or fusco-rufous, adnate, *margin nearly entire, lack of receptacle uniformly tomentose, almost subfurfuraceous;* spores 8, colourless, elongato-fusiform, 3-5-septate.

On mossy earth, stones, &c. very common.

SYN :—Linn. Fl. Suec. 1109. Nyl. Syn. 324. Mudd Man. 82. Grevillea 3. 168.
FIG :—E. Bot. 2299. Dill. t. 27. fig. 102. E. Hepp Sporen t.9 6. f. 575.

EXS :—M. and N. 154. Welw. 15. Schær. 28. Hepp 575. Anzi It. S. 91. Mandon 18. Bohl. 30. Reich. and Schub. 114. Wagn. 19. Mudd 59. Leight. 141.
GEOG. DISTRIB :—Europe, Asia, Africa, N. and Central America.
BOT. PROV :—1...3, 4, 5...7.. 10, 11, 12, 13...15, 16...(19—30). 31.
ENGLAND :—Berwick-upon-Tweed ! *Dr. G. Johnston.* Worcester ! *Dr. Holl.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Devonshire. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* near Ayton. *Mr. Mudd.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Swinnop, East Allendale, Northumberland ; Foreshield, Alston, Cumberland. *Rev. W. Johnston.* Shropshire !
SCOTLAND :—Forfarshire. *Mr. W. Gardiner.* Long Island ; Arran. *Prof. Balfour.* Ben Lawers ! *Dr. Holl.* Caerlaverock Road, Dumfries. *Dr. Lindsay.*
IRELAND :—Common. *Mr. Carroll.*
WALES :—Dolgelley ! *Dr. Holl.*
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores. .009 to .012 in. long, by .00075 in. broad. t 1. f. 22." *(Mudd.)* "Spores .066–70 mm. long, .0045 mm. broad." *(Nyl.)*

f. crispa, (Whlnb.) margins sorediate.

SYN :—Whlnb. Lapp. 446. (1812.) Mudd Man. 83.
EXS :—Leight. 262.
ENGLAND :—Ayton ! Lanbraugh rigg ! Yorkshire. *Mr. Mudd.*
IRELAND :—Glendalough ! Kylemore ! *Mr. Larbalestier.*
WALES :—Near Dolgelley !

3. *P. malacea, (Ach.)* cinereo-glaucescent or glauco-fuscescent, upper surface smooth but minutely punctato-tomentellose upwards immediately *below the apothecia ;* under surface tomentose, with *broad flattened confluent, brown, tomentose spongiose nerves terminating below the paler brown uniformly tomentose margin, densely nigricanti-spongiose towards the centre and base ;* apothecia fusco-rufous, margin crenato-incised, *connivent or incurved ;* back of receptacle *coarsely furfuraceous ;* spores 3-5-septate.

On mossy earth, 1873.

SYN :—Ach. Syn. p. 240. (1817.) Nyl. Syn. 323. Grevillea 3. 168.
FIG :—Sturm D. Fl. t. 17. Hepp Sporen t. 7. f. 50.
EXS :—M. and N. 1048. Zw. 223. Anzi It. S. 89. Rabh. 765. Reich. and Schub. 116. Hepp 50. Leight. 361.
GEOG. DISTRIB :—Switzerland, Germany, Sweden, Italy, Bavaria, Hungary, Himalaya, N. America, Kerguelen's Land.
BOT. PROV :—5, 6, 7...11...16.
ENGLAND :—Swinnop, E. Allendale, Northumberland. *Rev. W. Johnson.* Raglith ! and Hugliith ! near Church Stretton ; High Rock, near Bridgnorth ! Sharpstones Hill ! Craigforda !
SCOTLAND :—Inverary, Argyleshire. *Rev. J. M. Crombie.* (1873).
WALES :—Manorowen ! near Fishguard, Pembrokeshire ! Benarth ! near Conway ; between Corwen and Bala ! Craig Breidden !
"Spores .058—74 mm. long, .005—6 mm. broad." *(Nyl.)*

4. *P. rufescens,* (Hffm.) pale *cervine or cinereo-rufescent,* rotundato-lobate, *smooth, glabrous, under surface* floccose or reticulato-tomentose, *with permanent dark nigro-fuscous nerves, terminating in appressed flattened confluent pale brown smaller nerves at the margin and bearing scattered tufts of dark rhizinæ towards the centre ;* apothecia fuscous or rufo-fuscous, *margin crenulate, back* of receptacle *verrucoso-furfuraceous.*

On mossy earth, &c., not common.

SYN :—Hffm. Fl. Germ. 2. 107. Nyl. Syn. 324. Grevillea 3. 168.
FIG :—E. Bot. 2300. Dill. t. 27. f. 103. Hepp Sporen t. 7. f. 51.
EXS :—Mudd 60. Hepp 51. Reich. and Schub. 115. Spruce 57. Arn. 620. c.
GEOG. DISTRIB :—Europe, Asia, N. America, N. Zealand.

BOT. PROV :—1 ..5, 6, 7...10, 11...13, 14, 15, 16, 17, 18...20, 21...31.

ENGLAND :—Berwick-upon-Tweed! *Dr. G. Johnston*. near Worcester! *Dr. Holl*. Gunnerton Crags, near Barwesford; Shewing Shields, Northumberland; Teesdale and Healey Field, Durham. *Mr. Winch*. Lustleigh Cleve, Devon. *Mr. Parfitt*. Midland Counties. *Mr. Purton*. North Bovey! Manaton; Ilsington; Milborn Down, near Newton Abbott. *Messrs. Jones & Kingston*. near Easby! *Mr. Mudd*. Craigforda! Llanymynech Hill! Grinshill! Shropshire.

SCOTLAND :—Common. *Rev. J. M. Crombie*.

IRELAND :—Rosscarbery, Cork; Ballynagarde, Limerick. *Mr. Carroll*.

WALES :—Barmouth! *Rev. T. Salwey*. Dolgelley! Manorowen! near Fishguard. Moel-y-gest! near Tremadoc.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. Jersey. *Mr. Larbalestier*.

"Spores .042—62 mm. long, .004—5 mm. broad." (*Nyl.*)

5. *P. spuria*, (Ach.) cinereo-virescent, *small*, *digitato-lobate*, lobes ascending, smooth, *glabrous in the lower part*, *adpresso-tomentellose upwards* towards the apothecia, *under surface whitish with thick coarse spongioso-tomentose nerves and interstitial longitudinal whitish lacunæ;* apothecia fuscous or rufo-fuscous, *roundish*, *margin irregularly crenulate or denticulate*, *back of receptacle densely irregularly spongioso-tomentose;* spores 8, aciculari-fusiform, 3-7-septate.

On the earth, rare.

SYN :—Ach. Prodr. 159. (1798.) Nyl. Syn. 325. Mudd Man. 83.

FIG :—E. Bot. 1542.

EXS :—Hepp 576. Spruce Amaz. 56. Fellm. 70. M. and N. 837. Arn. 321.

GEOG. DISTRIB :—Europe, Australasia.

BOT. PROV :—1, 2, 3, 4, 5...7...11...15...31.

ENGLAND :—Sussex and Suffolk. *Sir W. J. Hooker*. near Berwick-upon-Tweed. *Dr. G. Johnston*. Oswestry, Shropshire. *Rev. T. Salwey*. near Totness; Shanklin Downs, Isle of Wight! *Dr Holl*. Kelvedon, Essex. *Mr. Varenne*. Exwick, Devon. *Mr. Parfitt*. Wall under Haywood! Raglith! Hopton Hill! Sutton Lane! Loppington! Shropshire.

SCOTLAND :—Trossachs! Blair Athole. *Rev. J. M. Crombie*.

WALES :—Ynysfaig. *Rev. T. Salwey*.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*.

"Spores .056—75 mm. long, .0035—45 mm. broad." (*Nyl.*)

6. *P. polydactyla*, Hffm. glauco-pallescent or pallido-fuscescent, *digitato-lobate*, *lobes ascending*, *glabrous and shining*, smooth or obsoletely impressed, beneath with *thick coarse spongioso-tomentose fusconigricant anastomosing more or less flattened nerves, and interstitial longtitudinal whitish lacunæ;* apothecia fuscous or fusco-rufescent, *longitudinal* revolute margin *irregularly crenulate*, back of receptacle *sub-verrucoso-tomentose;* spores 8, colourless, attenuato-fusiform, 3-7-septate.

On mossy earth, &c., rare.

SYN :—Hffm. Fl. Germ. 2. 106. (1795). Nyl. Syn. 326. Mudd Man. 83.

FIG :—Hffm. Pl. L. t. 4. f. 1.

EXS :—Bohl. 56. and 71. Tuck 10. Schær. 30. Mass. 260. M. and N. 633. Anzi It. S. 94. Mudd 61. Leight 172.

GEOG. DISTRIB :—Europe, Asia Africa, Polynesia, Australasia.

BOT. PROV :—1...5...10, 11, 12...14, 15, 16—(19—30), 31.

ENGLAND :—Kildale Moor! Cleveland. *Mr. Mudd*. Oswestry and Ludlow Shropshire. *Rev. T. Salwey*. near Eglestone, and on banks of the Derwent near Gibside, Durham. *Mr. Winch*. Alphington; Stoke Wood, Devon. *Mr. Parfitt*. Swinnop, East Allendale, Northumberland. *Rev. W. Johnson*. Ilsington; Beckey Fall; between Moreton and Exeter, Devon. *Messrs. Jones & Kingston*. Middle! Shropshire.

SCOTLAND :—Wall at Craighouse near Edinburgh. *Dr. Greville*. Forfarshire. *Mr. W. Gardiner*. Long Island; Arran. *Prof. Balfour*. near Aberdeen; Braemar; Blair Athole; Killin; Lorne. *Rev. J. M. Crombie*.

IRELAND :—Not unfrequent. *Mr. Carroll.* Glendalough, *Mr. Larbalestier.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey. *Mr. Larbalestier.*

Var. *hymenina*, Ach. glabrous, somewhat shining, under surface nearly without veins, fusco-fibrillose.

Amongst mosses on the ground, sparingly.

SYN :—Ach. Syn. 238.
EXS :—Hepp 851.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Glen Lochay, Perthshire. *Rev. J. M. Crombie.*

Var. *collina*, Ach. lobes crisped, margins sorediate.

On the ground, rare, 1875.

SYN :—Ach. SYN. 237. Nyl. Syn. 327.
BOT. PROV :—26.
IRELAND :—Killery Bay and Kylemore, Connemara. *Mr. Larbalestier.*

7. *P. scutata*, (Dicks.) virescenti-cinereous, *spreading, oblongo-lobate*, upper surface *glabrous below, minutely depresso-granulate upwards*, margins *undulato-crenate crisped and cæsio-sorediate*, under side with pale brown spongioso-tomentose flattened anastomosing nerves and interstitial white lacunæ ; apothecia fuscous or fusco-rufescent, adnate, suborbicular, margin *irregularly crenulate, back of receptacle spongioso-tomentose ;* spores 6-8, colourless, acicular or elongato-fusiform, 3-septate.

On mossy earth and trees, rare.

SYN —Dicks. Crypt. fasc. 3. 18. (excl. syn.) (1793.) Nyl. Syn. 327. Mudd Man. 83.
FIG :—E. Bot. 1834.
EXS .—Anzi Langob. 25. Spruce Amaz. 416. M. and N. 541. Rabh. 914.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—1...5...7.. 11, 12...15.
ENGLAND :—Westmoreland. *Sir J. E. Smith.* Pentregaer near Oswestry, Shropshire ! *Rev. T. Salwey.* Kielder and Dead Water Fell, Northumberland. *Prof. Balfour.* South Brent, Devon ! Ivy Bridge, S. Devon ! *Dr. Holl.* Lustleigh Cleve, Devon. *Mr. Parfitt.* near Symonds Yatt. *Mr. W. Joshua.*
SCOTLAND :—Scotland. *Mr. Dickson.* Inverary. *Messrs. D. Turner & Hooker.* Clova. *Mr. W. Gardiner.* Ardtur. *Capt. Carmichael.* near the Rae Hills. *Sir W. Jardine & Dr. Greville.* Rumbling Bridge. *Prof. Balfour.* Killin, Perthshire ! *Dr. Holl.* Trossachs. *Rev. J. M. Crombie.*
WALES :—Hafod, Cardiganshire. *Sir J. E. Smith.* Corsygedol and Llyn Bodlyn. *Rev. T. Salwey.* Nannau, near Dolgelley ! *Dr. Holl.* Glanartro ! Llanbedr. Gwydir woods ! Bettws-y-coed.

*B. Apothecia horizontal.*

8. *P. horizontalis*, (L.) pale or pallido-fuscescent or glauco-pallescent, rotundato-lobate, *glabrous, smooth* or *slightly impressed, shining*, margins sinuato-crenate and slightly undulate ; under surface with pale brown and fuscous black coarse flattened anatomosing or confluent nerves and interstitial white lacunæ ; apothecia fuscous or fuscous-black, rotundate or elliptical, *plane, horizontal ;* margins *irregularly crenulate, often inflexed*, back of receptacle *verrucoso-tomentose ;* spores 6-8, colourless, or pale fuscescent, fusiform, 3-septate.

On mossy rocks, trees, and walls, not common.

SYN :—Linn. Mant. 132. (1771.) Nyl. Syn. 327. Mudd Man. 84.
FIG :—E. Bot. 888. Tul. Mem. t. 8. f. 4—14. Nyl. Syn. t. 8. f. 39. Hepp Sporen t. 97. f. 852.

Exs :—Bohl. 37. Schær. 27. Breutel 118. Nyl. 110. Tuck. 11. 12. M. and N. 345. Mudd 62. Maud. 27. Mass. 214. Leight. 108. Anzi It. S. 93. Hepp 852.

Geog. Distrib :—Europe, N. America.

Bot. Prov :—1 . 2...5, 6, 7, 8...10, 11, 12...14, 15, 16...19, 20 26...30.

England :—Bardon Hill, Leicestershire. *Rev. A. Bloxam.* Keswick, Cumberland. *Mrs. Stanger.* Yorkshire! *Mr. G. Dixon.* Stogdale! and Oggeray Gill! Cleveland. *Mr. Mudd.* Craigforda, Oswestry, Shropshire; Wickcliff Rocks, Ludlow. *Rev. T. Salwey.* Gunnerton Crags; Cheviots above Langley Ford, Northumberland; Hagerag Wood in Teesdale Forest and Healey Field, Durham. *Mr. Winch.* St. Leonard's Forest, Sussex. *Mr. Larbalestier.* Dunsford Hill, near Exeter; Ilsington, &c., Devon. *Messrs. Jones & Kingston.* Bucknell churchyard wall! Lilleshall Abbey! Shropshire.

Scotland :—Loch Tay, Perthshire! and Aberfeldy road. *Dr. Lindsay.* Berwickshire! *Dr. G. Johnston.* Forfarshire. *Mr. Gardiner.* Arran. *Prof. Balfour.* Breadalbane, Appin and Lochaber. *Rev. J. M. Crombie.*

Ireland :—Lota Wood, Cork. *Mr. J. Carroll.* near Killarney. *Dr. Taylor.* Derry and Antrim. *Dr. Moore.* Glandalough! Doughruagh! Galway. *Mr. Larbalestier.*

Wales :—Aber. *Rev. H. Davies.* valley above Halfway House, between Barmouth and Dolgelley. *Rev. T. Salwey.* Gwydir woods! Bettws-y-coed. River Gwaine! Manorowen! near Fishguard, Pembrokeshire. Bontnewydd! near Dolgelley.

"Spores .005 to .006 in. long, by .001 to .00125 in. broad." (*Mudd.*) "Spores .030—42 mm. long, .006—7 mm. broad." (*Nyl.*)

Var. *muscorum*, Schær. smaller in every part.

Amongst mosses on walls, very rare.

Syn :—Schær. Spic. 264. Enum. 21.

Geog. Distrib :—Europe.

Bot. Prov :—15...26.

Scotland :—Glen Lochay. *Rev. J. M. Crombie.*

Ireland : -Kylemore, and near Delphi, Connemara. *Mr. Larbalestier.*

9. *P. venosa*, (L.) pale or pallido-cinereous or glauco-cinerascent, *small, simple, sub-ascending* or sub-erect, *flabelliformi-lobate, smooth and glabrous, albo-tomentose beneath, with strong black or fuscous-black nerves ramifying from the base;* apothecia fuscous-black, rotundate, plane, *horizontal*, disk rough and granular, margin *striato-crenulate;* back of receptacle *nigro-tomentose;* spores 6-8, colourless or pale fuscescent, fusiform, 3-septate.

On the earth, rare.

Syn —Linn. Fl. Suec. 1097. (1755.) Nyl. Syn. 328. Mudd Man. 84.

Fig :—E. Bot. 887. Hffm. Pl. L. t. 6. f. 2. Hepp Sporen t. f. 172.

Exs :—Hepp 172. Schær. 27. M. and N. 153. Mass. 17. Anzi It. S. 95. Reich. and Schub. 40. Rabh. 814.

Geog. Distrib :—N. Europe, N. Asia, N. America.

Bot. Prov :—5 . 13, 14, 15...30.

England :—Whitecliff Rocks, near Ludlow, Shropshire!

Scotland :—Foot of Ben Lawers! and Birks of Aberfeldy. *Mr. Hugh Macmillan.* near Killin, Perthshire! *Dr. Gilchrist.* Ben Lawers! *Mr. J. Carroll.* Pass of Killiecrankie, Perthshire. *Rev. J. Dalton.* Glen Kill Linn and Burn, Dumfriesshire. *Dr. Burgess.* Blair in Athole. *Messrs. Borrer & Hooker.* Habbies How in the Pentland Hills. *Dr. Greville.* Reeky Linn; Foot of the White Hill above Auchterhouse, Forfarshire. *Mr. W. Gardiner.* West Water, near Old Castle of Edgell. *Mr. H. Croall.*

Ireland :—Knockagh Hills, co. Antrim. *Mr. D. Moore.*

"Spores .005 to .007 in. long, by .001 to .00125 in. broad. t. 1. f. 23." (*Mudd.*) "Spores .030—45 mm. long, .007—8 mm. broad." (*Nyl.*)

## Sub-Tribe III. SOLORINEI.

Thallus membranaceous, opake, stratum gonidiale consisting of granula gonima, not gonidia. Apothecia innate, scattered on the upper surface of thallus. Spores fuscous, bilocular.

## III. SOLORINA. *Ach.*

Thallus fragile, cortical layer not continued over the under surface, which is obsoletely nervose. Apothecia rotundate or oblong, spadiceo-rufescent or fuscous-black, innate, scattered on upper surface of thallus. Spores fuscous, 1-septate. Stratum gonidiale of granula gonima not gonidia, bright green.

1. *S. crocea*, (L.) *coriaceous*, cinnamomeo-or rufescenti-cinerascent, (dark-green when moist) orbicular, laciniato-lobate, lobes rotundo-obovate, margin undulate, *appresso-furfuraceous below, smooth upwards, under surface deep orange-coloured, appresso-tomentose, subpalmato-nervose;* apothecia fuscous or fusco-rufescent, roundish, *adnate, plane, subtumid, immarginate;* spores 8, pallido-rufescent, *fusiformi-ellipsoid*, 1-septate.

On the ground in alpine localities, rare.

SYN :—Linn. Fl. Suec. 1101. (1755.) Nyl. Syn. 329. Mudd Man. 85.
FIG :—E. Bot. 498. Hffm. Pl. L. t. 41. f. 2—4. and t. 42. f. 4. 5. Nyl. Syn. t. 8. f. 40. Hepp Sporen t. 66. f. 577.
EXS :—Hepp 577. Th. Fr. 5. Schær. 24. Rabh. 767. Anzi It. S. 86. Fellm. 72.
GEOG. DISTRIB :—Europe, Asia.
BOT. PROV : -14, 15...19.
SCOTLAND :—Forfarshire. *Mr. Don.* Edinburgh. *Mr. Mackay.* top of Ben Lawers! *Dr. Burchell and Dr. Lindsay.* on all the Breadalbane Mountains at 3000 ft. as Ben More, Ben Challum, Craig Challeach, back of Craig na Gour, Mael Ghyrdy, &c. *Mr. A. McKinlay.* summits of the Highland Mountains, Ben Lomond, &c. *Sir W. J. Hooker.* summits of Bassies, White Bent, &c., Clova. *Mr. W. Gardiner.* Peak of Mamsoul, Invernessshire. *Dr. B. White.* Ben Lomond; Morrone. *Rev. J. M. Crombie.*
IRELAND :—On Brandon, Kerry. *Dr. Moore.*
"Spores .007 to .008 in. long, by .002 in. broad." *(Mudd.)* "Spores .034—53 mm long, .010—13 mm. broad." *(Nyl.)*

2. *S. saccata*, (L.) *membranaceo-papyraceous*, pallido-fuscescent (bright green when moist), orbicular, rotundo-lobate, margins broadly and shallowly crenate, *smooth below, albo-granulato-pruinose upwards;* under surface *paler, appresso-spongioso-tomentose, rhizinose;* apothecia fuscous or nigro-fuscous, *urceolato-appressed;* spores 4, rufo-fuscescent, *ellipsoid.* 1-septate.

On the ground in moist shady alpine localities, not common.

SYN :—Linn. Fl. Suec. 1102. (1755 ) Nyl. Syn. 330. Mudd Man. 85.
FIG :—E. Bot. 288. Schær. En. t. 2. f. 5. Journ. Linn. Soc. Bot. 9. t. 2. f. 8. Hepp Sporen t. 19. f. 171.
EXS :—Nyl. 29. Hepp 171. Schær. 25. Mudd 63. M. and N. 61. Mass. 126. Anzi It. S. 85. Bohl. 4. Dicks. 25. Rabh. 855.
GEOG. DISTRIB :—Europe, N America.
BOT. PROV :—3, 4, 5...7, 8...10, 11, 12...15, 16...19...27...30.
ENGLAND :—N. W. Yorkshire; near Matlock, Derbyshire; *Sir J. E. Smith.* Cambridgeshire. *Rev. R. Relhan.* Falcon Clints and White Force, Teesdale, Durham! Kildale, Cleveland! *Mr. Mudd.* Studley Park, Yorkshire. *Mr. W. Brunton.* St. Vincent's Rocks, Bristol! *Miss M. Atwood.* Ingleborough. *Mr. J. G. Baker.* Weardale! *Sir W. C. Trevelyan.* Cheddar and St. Vincent's Rocks. *Messrs. Turner and Sowerby.* Middleton-in-Teesdale, Durham. *Mr. Winch.* near Buxton. *Dr. Holl.* Via Gellie, Derbyshire. Apes Tor, Staffordshire. *Rev. A. Bloxam.* Headington, Oxford. *Mr. Baxter.* Foreshield Wood, Alston, Cumberland. *Rev. W. Johnson.* White-cliff Rocks! near Ludlow, Shropshire.
SCOTLAND :—Ben Lawers. *Mr. H. Macmillan.* Highlands of Scotland. *Sir W. J. Hooker.* Inchnadamff! *Sir W. C. Trevelyan.* Glen Dole, Canlochan; Glen Prosen; Reeky Linn, Forfarshire. *Mr. W. Gardiner.* near Killin. *Dr. Holl.* Morrone; Craig Tulloch; Finlarig, Killin! Appin. *Rev. J. M. Crombie.*

WALES :—Anglesea, *Rev. H. Davies.* Glyn, near Capel Curig !
IRELAND :—On Brandon Hill, Kerry ; Ben Bulben, Sligo. *Mr. J. T. Mackay.* Cushendall, Antrim. *Dr. Moore.*
"Spores .008 in. long, by .0035 in. broad. t. 1. f. 24." *(Mudd.)* "Spores .032—60 mm. long, .018—27 mm. broad." *(Nyl.)* Spores .05 mm. long, .02 mm. broad.

3. *S. limbata*, (Sommf.) *subcoriaceous*, fuscescent, dark-green and gelatinous when moist, *granulato-plicato-squamulose, albo-pruinose ;* apothecia fuscous or nigro-fuscous, *large, urceolate, bordered by a plane expanded crenate albo-furfuraceous granulate margin ;* spores 4, rufo-fuscescent, *broadly and obtusely oblong*, 1-septate.

On the earth among wet mossy rocks, rare.

SYN :—Sommf. Fl. Lapp. 105. (1826.) Nyl. Syn. 331. Mudd Man. 85.
FIG :—E. Bot. 1374. Sommf. Fl. Lapp. t. 3. f. 1...9. Journ. Linn. Soc. Bot. 9. t. 2. f. 9. & 10.
EXS :—Anzi Langob. 46. Smrft. 149.
GEOG. DISTRIB :—Scandinavia, Europe, N. America.
BOT. PROV :—4...10, 11...15...30.
ENGLAND :—Durham. *Rev. J. Harriman.* Ayton, Cleveland ! *Mr. J. G. Baker.* Cambridge ! *Mr. G. Bentham.* Ingleborough. *Dr. Carrington.* Guisbro' Moor, Cleveland. *Mr. Mudd.*
SCOTLAND :—Ben Lawers. *Dr. Holl.*
IRELAND :—Head of Glenarriff, co. Antrim. *Dr. Holl.*
"Spores .008 to .009 in. long, by .003 to .0035 in. broad." *(Mudd.)* "Spores .030—50 mm. long, .018—23 mm. broad." *(Nyl.)* Spores .032—.033 mm. long, .014—.015 mm. broad.

4. *S. bispora*, Nyl. *albo-pruinose*, slightly developed, *lobes small ;* almost entirely occupied by the crowded, moderate, deeply *urceolate apothecia*, or changed into *isidiose or granulose thalline limbs ; spores* 2, rufo-fuscous, oblong, 1-septate ; stratum gonimon bright green.

On earth in alpine localities, rare. 1871.

SYN :—Nyl. Syn. 331 (1860.) Stirton in Grevillea, 2. 60.
FIG :—Nyl. l. c. t. 8. f. 42.
EXS :—Arn. 486.
GEOG. DISTRIB :—Pyrenees, Tyrol, North Italy.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Dr Stirton.*
Possibly *S. limbata* and *S. bispora* may be states of *S. saccata.* "Spores .065—88 mm. long, .033—42 mm. broad." *(Nyl.)*

## TRIBE XII. PARMELIEI.

Thallus frondoso-dilatate or lobate or lobato-laciniate or stellato laciniate, sometimes somewhat terete, and fruticuloso-imbricate. Apothecia lecanorine or in a cupuliform receptacle. Sterigmata pluri-articulate or with arthrosterigmata.

### SUB-TRIBE I. STICTEI.

Thallus membranaceo-lobate, the under surface rhizinose, and with pulverulent pseudo-cyphellæ or true urceolate cyphellæ. Apothecia with distinct paraphyses. Spores fusiform, 1—3 rarely pluri-septate.

## I. STICTINA. *Nyl.*

Thallus variously lobed or laciniato-lobate. Rhizinæ simple. Stratum gonidiale consisting of granula gonima of a dark blue-green colour.

### A. *Pseudo-cyphellæ white.*

1. *S. intricata*, (Del.) the typical species figured in Delise's Stictæ, t. 7. f. 33. has not been observed in Great Britain.

Var. *Thouarsii*, (Del.) coriaceous, pallido-fuscescent, *sinuato-lobate, lobes short and broad, with cæsious-white soredia scattered over the surface, aud especially on the margins*, under surface tomentose nigro-fuscescent, paler brown towards circumference; apothecia not found.

On trees and rocks, rare.

SYN :—Del. St. p. 90. (1822), Nyl. Syn. 335. Mudd Man. 90.
FIG :—Del. St. t. 8. f. 29.
EXS :—Crombie 33.
GEOG. DISTRIB :—Africa, Central America, Java.
BOT. PROV :—1...7...15...12...21...26...30.
ENGLAND :—Near Hay Tor, Dartmoor. *Dr. Holl.*
SCOTLAND :—Inverary. *Adm. Jones.* Ben Lawers! Barcaldine, Lorne, *Rev. J. M. Crombie.*
IRELAND :—Brandon Mountains; Glenarm. *Dr. Moore.* Cromaglown. *Mr. Carroll.* Fenagh, co. Carlow. *Adm. Jones.* Mountains of Maam, Connemara. *Mr. Larbolestier.*
N. WALES :—Arthog, near Dolgelley. *Rev. T. Salwey.*

### B. *Pseudo-cyphellæ yellow.*

2. *S. crocata*, (L.) lurido-fuscescent, shining, *broadly rotundo-lobate, crenate, reticulato-lacunose, reticulations and margins bearing citrine soredia*, under side fusco-nigricant, tomentose; apothecia scattered, blackish, margins crenate, at length excluded; spores 6—8, fuscescent, oblongo-fusiform, 1-septate.

On trees, mosses, &c. very rare.

SYN :—Linn. Mant. 310. (1771). Nyl. Syn. 338. Mudd Man. 89.
FIG .—E. Bot. 2110.
EXS :—Tuck. 65.
GEOG. DISTRIB :—Spain, W. and Central Africa, America, Java, N. Holland, N. Zealand.
BOT. PROV :—1...14, 15...19...30.
ENGLAND :—Dartmoor. *Rev. J. M. Crombie.*
SCOTLAND :—Highland Mountains. *Mr. Dickson.* Glen Morriston, Inverness-shire. *Messrs. Turner, Hooker, & Greville.* Inverary! *Messrs. Borrer & Hooker.* Ben Lawers! Birks of Aberfeldy. *Mr. Macmillan.* rocks east of Dalmahoy Hill, near Edinburgh. *Dr. Maingay.* Glen Falloch. *Dr. Holl.* Glencroe! *Dr. Macmillan.*
IRELAND :—Fairbread co. Antrim. *Mr. Templeton.* Pigeon Island in the River Kenmare. *Dr. Taylor.* near Cushendall, co. Antrim. *Dr. Moore.*
"Spores .005 to .007 in. long, by .0015 to .00175 in. broad." (*Mudd.*) "Spores .020—32 mm. long, .009—.010 mm. broad." *(Nyl.)*

### C. *Cyphellæ urceolate.*

3. *S. limbata*, (Sm.) pale cervino-rufescent, *monophyllous*, rotundo-lobate, smooth and unequal, *margins densely and copiously cæsio-sorediate*, under surface pale brown, tomentose; apothecia not seen.

On mossy shady rocks and trees, rare. 1745.

SYN :—Sm. E. Bot. 1104. (1802). Nyl. Syn. 346. Mudd Man. 88.
FIG :—E. Bot. 1104. Hepp Sporen t. 41. f. 369.
EXS :—Larb. 15. Schær. 557. Welw. Lusit. 3.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2. 3 . 5, 6, 7...11...14, 15...19.. 30, 31.
ENGLAND :—Bagley Wood, near Oxford. *Dillenius.* (1745). Quan Wood, near Ryde, Isle of Wight! *Rev. A. Bloxam.* Hambury Gill, Teesdale, Durham. *Rev. J. Harriman.* near Exeter, Devon. *Mr. E. Parfitt.* Hay Coppice, Herefordshire. *Rev. T. Salwey.* Eglestone, Durham! Cheviots above Langley Ford, Northumberland. *Mr. Winch.* Torquay. *Dr Holl.* Heavitree, Devon. *Mr. Parfitt.* Bagtor; North Bovey; Bottor rocks, Devon. *Messrs. Jones & Kingston.*
SCOTLAND :—Braid Hermitage, near Edinburgh. *Sir J. E. Smith.* Glen Nevis, Invernesshire! Lochaber. *Dr. Lindsay.* Birks of Aberfeldy. *Mr. Macmillan.* Loch Lomond and Falls of the Clyde. *Messrs. Turner & Hooker.* near Balmuto. *Dr. Greville.* Clova. *Mr. G. Don.* Killin. *Dr. Holl.*
IRELAND :—Near Cork, and near Muckross, Killarney. *Mr. Carroll.* near Belfast. *Mr. Templeton.* near Bantry. *Miss Hutchins.* Killarney. *Dr. Carrington.* Glenarm. *Dr. Moore.*
WALES :—Hafod. *Sir J. E. Smith.* Snowdon. *Mr. D. Turner.* Corsygedol! and Abergwynant. *Rev. T. Salwey.* Gloddaeth near Conway! Dolgelley! Barmouth! Glyn! near Capel Curig; Drwsynant! Gwydir woods! Bettws-y-coed. Capel Arthog!
CHANNEL ISLANDS ;—Rozel, Jersey! *Mr. Larbalestier.* Jerbourg, Guernsey. *Rev. T. Salwey.*
"Spores .005 to .006 in. long, by .00125 to .0015 in. broad." *(Mudd.)*

4. *S. fuliginosa,* (Dicks.) cervine or cinereo-fuscescent, *monophyllous,* scrobiculate, unequal, *rotundo-lobate, covered with dark-isidiose efflorescence,* under surface pale brown tomentose; apothecia scattered, rufescent, *piloso-ciliate;* spores 6-8, colourless, fusiform, 1-3 septate.

On rocks and trees in alpine localities, rare. 1785.

SYN :—Dicks. Cr. Br. 1. 13. (1785). Nyl. Syn. 347. Mudd Man. 88.
FIG :—E. Bot. 1103. Hepp Sporen t. 41. f. 371.
EXS :—Welw. Lusit. 7. Schær. 386. Nyl. 30. Zw. 224. Anzi It. S. 97 M. and N. 542. Larbal. 61.
GEOG. DISTRIB :—Europe, Africa, America, N. Zealand.
BOT. PROV :—1...5, 6, 7...12, 13...15, 16...19...26...31.
ENGLAND :—Ambleside, Westmoreland. *Sir J. E. Smith.* Rockwood Grove, Boconnoc, Cornwall. *Mr. E. Forster.* Castellet rocks, Keswick, Cumberland! *Mrs. Stanger.* Launceston; Bodmin. *Messrs. Turner & Sowerby.* South Brent, Devon. *Dr. Holl.* Moreton, Devon. *Mr. Parfitt.* Bagtor Woods; Ilsington; Manaton, Devon. *Messrs. Jones & Kingston.* Whitecliff rocks, near Ludlow, Shropshire!
SCOTLAND :—Crinan Canal, Argyleshire! and Glenesk, Forfarshire! *Dr. Lindsay.* Coill-dh'ue, near entrance of Glenlyon. *Mr. Macmillan.* near Dumfries (in fruit). *Dr. Richardson.* Falls of the Clyde, and near Inverary and Ballycheulish. *Messrs Turner & Hooker.* Bold Craig, Moffat. *Dr. Nichol.* Langton Lees, Cleuch! *Sir W. C. Trevelyan.*
IRELAND :—Roadside between Kenmare and Killarney. *Dr. Taylor.* Killarney. *Dr. Carrington.* Derryclare! Connemara. *Mr. Larbalestier.*
WALES :—Hafod, Cardiganshire. *Sir J. E. Smith.* Garth Woods and Cwm Bychan. *Rev. T. Salwey.* Aber Valley; Aberdovey; near Bangor. *Rev. A. Bloxam.* Barmouth and near Dolgelley; Glyn! near Capel Curig; Drwsynant! Gwydir Woods! Bettws-y-coed; Trefriw! Capel Arthog!
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Sark. Bonne Nuit Bay; Havre Giffard; La Coupe, Jersey! *Mr. Larbalestier.*
"Spores .005 to .006 in. long, by .00125 to .00175 in. broad." *(M dd.)*
"Spores .027—40 mm. long, .007—8 mm. broad." *(Nyl.)*

5. *S. sylvatica,* (L.) cervine or cinereo-fuscescent, *scrobiculate,* unequal, *laciniato-lobate, furfuraceous above;* apothecia *scattered,* margin *naked;* spores fusiform, 1-septate.

On mossy rocks, &c.

SYN :—Linn. Sp. Pl. No. 65. (1753). Nyl. Syn. 348. Mudd Man. 87.
FIG :—E. Bot. 2298.
EXS :—Schær. 258. M. and N. 155. Nyl. 111. Hepp 868. Anzi It. S. 96. Rabh. 910. Leight. 109.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV.:—1...5, 6, 7...11...15, 16...19...26.
ENGLAND :—Oswestry, Shropshire; Hay Coppice, Herefordshire. *Rev. T. Salwey.* Kielder and Deadwater Fell, Northumberland. *Prof. Balfour.* Cawsey, Eglestone and Blackstone Bank Woods, Durham; Cheviots above Langley Ford and East Common Wood, Northumberland. *Mr. Winch.* near Bigbury, S. Devon. *Dr. Holl.* Budleigh Salterton, Devon. *Dr. Dickie.* Dartmoor. *Messrs. Jones & Kingston.*
SCOTLAND :—Killin. *Dr. Holl.* Falls of Moness, Perth, *Lady Wilson.* Birks of Aberfeldy, *Mr. H. Macmillan.* Drumlanrig Wood. *Mr. W. Stevens.* Braemar. *Mr. A. Croall.* Falls of the Clyde. *Mr Hopkirk.* Inverary and Ballacheulish. *Messrs. Turner & Hooker.* Appin and Lochaber; Inverary. *Rev. J. Crombie.* Reeky Linn, Forfarshire. *Mr. W. Gardiner.* New Hall, North Esk, near Carlops; Glen Queich, Ochils. *Dr. Nichols.*
IRELAND :—Blackwater Bridge, co. Kerry. *Dr. Taylor.* Lough Inagh; Connemara. *Mr. Larbalestier.*
WALES :—Barmouth! *Rev. T. Salwey.* near Dolgelley. *Dr. Holl.* Aber Valley, Rhewgreidden. *Rev. A. Bloxam.* Trefriw! Conway Falls! Glanartro! Llanbedr.
"Spores. 025—27 mm. long, .008.—.010 mm. broad." (*Nyl.*)

6. *S. Dufourei*, (Del.) glaucescent or glauco-fuscescent, *smooth*, margins of laciniæ *minutely dissecto-fimbriate*, under surface pallescent, slightly tomentose or nearly naked; apothecia not seen.

On mossy rocks and trees, rare.

SYN :—Del. St. p. 78. (1826). Nyl. Syn. 348. *St. ciliata*, Tayl. Mack. Fl. Hib. 2. 152. *St. elegans*, Mudd Man. 89.
FIG :—Del. St. t. 6. f. 22.
EXS :—Leight. 173. Welw. Lusit. 5.
GEOG. DISTRIB :—Europe, Canaries, Madeira.
BOT. PROV :—1...16...19.
ENGLAND :—Rock Walk, Ilsham near Torquay. *Dr. Deakin.* near South Brent, Devon. *Dr. Holl.* Clicketor Rocks, near Menheniot Station, Cornwall. *Mr. Curnow.*
SCOTLAND—Appin. *Rev. J. M. Crombie.*
IRELAND :—Killarney, *Mr Carroll & Dr. Carrington.* Askew Wood, co. Kerry. *Dr. Taylor.*

D. *Ecyphellate, bullate.*

7. *S. scrobiculata*, (Scop.) *glauco-flavescent, reticulato-scrobiculate, sorediate;* under surface tomentose fuscescent *albido-bullate;* apothecia scattered, margin thick entire inflexed; spores 8, colourless, fusiform, 3-7 septate.

On trees, rare. 1794.

SYN :—Scop. Carneol, p. 384. (1772). Nyl. Syn. 353. Mudd Man. 87.
FIG :—E. Bot. 497. Hffm. Pl. L. t. 1. f. 1. Hepp Sporen t. 68. f. 592. Mudd Man, t. 1. f. 26.
EXS :—Leight. 201. Hepp 592. Mudd 65. M. and N. 444. Fellm. 74. Schær. 490. Welw. Lusit. 6. Larb. 14. Anzi Etr. 47. Rabh. 837.
GEOG. DISTRIB :—Europe, Asia, North America.
BOT. PROV :—1, 2...5...7, 8...10, 11, 12..15...19...31.
ENGLAND :—Coneysthorpe Banks, Castle Howard, Yorkshire. *Mr. Teesdale.* (1794). Keswick, Cumberland! *Mrs. Stanger.* Oggeray Gill, Yorkshire! *Mr. Mudd.* Charnwood Forest, Leicestershire! Quarn Wood, Ryde, Isle of Wight! *Rev. A. Bloxam.* Eglestone, Durham. *Rev. J. Harriman.* near Ripon, Yorkshire. *Mr. W. Brunton.* Exeter, Devon. *Mr. Parfitt.* Penmanshiel Wood! Bodmin and Liskeard. *Messrs. Turner & Sowerby.* Rawse Castle! near Longfor-

macus! Berwick-on-Tweed. *Dr. Johnston.* Hay Coppice, Herefordshire. *Rev. T. Salwey.* Cheviot above Langley Ford, Northumberland; Shipley Wood near Eglestone; near the High Force. Teesdale; Waskerley Bourn near Wolsingham, Durham. *Mr. Winch.* near Ivy Bridge, South Devon. *Dr. Holl.* Plymouth; Torquay; Anstey Cove, &c., Exeter. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Kielder and Deadwater Fell, Northumberland. *Prof. Balfour.* Beckey Fall; Bagtor Woods; Lustleigh Cleve; North Bovey; Inwardleigh; Bottor Rocks; North Pomeroy Castle, Devon. *Messrs. Jones and Kingston.*

SCOTLAND:—Ben Nevis! *Dr. Lindsay.* Pentland Hills. *Mr. Maughan.* Clova; Reeky Linn; Lundie Craigs; sands of Barrie. *Mr. W. Gardiner.* Largo, Fifeshire. *Mr. Howie.*

IRELAND:—Near Bantry. *Miss Hutchins.* Killarney. *Dr. Carrington.*

WALES:—Corsygedol and Abergwynant. *Rev. T. Salwey.* Rhaiadr Du near Dolgelley. *Dr. Holl.* Gwydir woods! Bettwe-y-coed. Trefriw! Capel Arthog! Glanartro! Llanbedr.

CHANNEL ISLANDS:—La Coupe, Boulay Bay, Jersey. *Mr. Larbalestier.* Jerbourg, Guernsey. *Rev. T. Salwey.*

"Spores .010 to .015 in. long .00175 in. broad." (*Mudd.*) "Spores .050—08 mm. long, .006—7 mm broad." (*Nyl.*)

## II. STICTA. *(Ach. pr. p.)*

Thallus variously lobed or laciniato-lobate. Rhizinæ simple. Stratum gonidiale consists of true gonidia of a yellow-green colour. A *Ecyphellate, bullato-reticulato-tomentose beneath.*

1. *S. pulmonaria*, Ach. pallido-cervine, *reticulato-foveolate, laciniato-lobate, sinuate, truncate, under surface reticulato-tomentose, bullate;* apothecia *marginal*, margin rugulose, crenulate; spores colourless, oblongo-fusiform, 1-3-septate.

On trees.

SYN:—Ach. L. U. p. 449. (1810). Nyl. Syn. 351. Mudd Man. 87.

FIG:—E. Bot. 572. Hffm. Pl. L. t. 1. f. 2. Nyl. Syn. t. 8. f. 44.

EXS:—Welw. Lusit. 2. Mass. 38. Hepp 591. Schær. 384. M. and N. 62. Anzi It. S. 98. Smrft. 151. Reich. and Schub. 134. Leight. 74.

GEOG. DISTRIB:—Europe, Africa, Asia, America, Australasia.

BOT. PROV:—1, 2, 3, 4, 5...7, 8...10, 11, 12...15...19...31.

ENGLAND:—Camelford; Launceston. *Messrs. Turner and Sowerby.* Charnwood Forest, Leicestershire! *Rev. A. Bloxam.* Coppice near Ludlow; Pentregaer near Oswestry. *Rev. T. Salwey.* Keswick, Cumberland. *Mrs. Stanger.* Stogdale, Cleveland! *Mr. Mudd.* Ripon, Yorkshire. *Mr. W. Brunton.* Boltby near Thirsk. *Mr. J. G. Baker.* Hilks Woods, Ingleborough. *Dr. Carrington.* Hapford Wood, Devonshire. *Miss M. Atwood.* Longformacus! *Dr. G. Johnston.* Kielder and Deadwater Fell, Northumberland *Prof. Balfour.* near Northank and Rothbury, and Cheviot above Langley Ford, Northumberland; Blackstone Bank Wood near Wolsingham; near Eglestone and Middleton-in-Teesdale, Durham. *Mr. Winch.* between Heatley Field and Allansford, Durham. *Mr. Thornhill.* near Totness, South Devon; Isle of Wight. *Dr. Holl.* Teignmouth; Budleigh Salterton, Devon. *Mr. Parfitt.* Coleshill, Warwickshire. *Rev. W. T. Bree.* Bagley Wood near Oxford. *Mr. Baxter.* Gloucestershire. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Cambridgeshire. *Rev. R. Relhan.* Ilsington; Lustleigh Cleve; Beckey Fall near Manaton; Whiddon Park; Harford; Berry Pomeroy Castle; Morwell rock near Tavistock; Bottor rocks, Devon. *Messrs. Jones and Kingston.*

SCOTLAND:—Inverary! *Mr. W. Wilson.* Barncluith near Glasgow. *Mr. Hopkirk.* Beld Craig, Moffat. *Dr. Nichol.* Pentland Hills. *Mr. Maughan.* Humby Wood. *Dr. Greville.* Langton Wood! *Sir W. C. Trevelyan.* Glen Dole; Craigs of Lundie; Hill of Turin; Reeky Linn. *Mr. W. Gardiner.* Rock of St. Skae near Usan. *Mr. A. Croall.* Arran. *Prof. Balfour.* Finlarig near Killin. *Dr. Holl.* Western Grampians. *Rev. J. M. Crombie.*

IRELAND:—Woods near Killarney, common. *Dr Taylor.*

WALES:—Baron Hill near Beaumaris. *Rev. A. Bloxam.* Torrent Walk near Dolgelley! Glyn! near Capel Curig, Bettws-y-coed!

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* La Coupe, Boulay Bay, Jersey. *Mr. Larbalestier.*

"Spores .005 in. long, by .0015 to .00175 in. broad." (*Mudd.*) "Spores .018—30 mm. long, .005—9 mm. broad." (*Nyl.*)

B. *Cyphellate.*

2. *S. damæcornis*, (Sw.) var. *macrophylla*, (Hook.) pale fusco-rufescent, *smooth*, laciniate, *lobes broadly dilated, sinuate, retuso-truncate*, under surface dark brown tomentose ; apothecia marginal or scattered, margin entire or obsoletely crenulate ; spores colourless, fusiform, 1-3-septate.

On shady rocks, very rare.

SYN :—Hook. Br. Fl. 2. 205 (1833). Mudd Man. 89. Nyl. Syn. 356.
FIG :—E. Bot. Suppl. 2697. Hepp Sporen t. 99. f. 869.
EXS :—Hepp 369.
GEOG. DISTRIB :—America, Africa, Polynesia, Australasia.
BOT. PROV :—19.
IRELAND :—Turk Cascade near Killarney ! Cromagloun Mountains. *Mr. Wilson.* Killarney (in fruit) ! *Mr. Carroll.* roadside near Kenmare and Killarney. *Dr. Taylor.*

"Spores .005 to .006 in. long, by .0015 in. broad." (*Mudd.*)

C. *Pseudo-cyphellate, citrine.*

3. *S. aurata*, Ach. *red*, lobate, *sinuato-incised, crenato-undulate, citrino-pulverulent ;* under side fusco-nigricant, rufescent towards margins, tomentose ; apothecia subpodicellate, margin inflexed ; spores fuscescent, fusiform, 3-septate.

On trees and rocks, rare.

SYN :—Ach. Meth. 277. (1803), Nyl. Syn. 361. Mudd Man. 90.
FIG :—E. Bot. 2359. Hepp Sporen t. 41. f. 372.
EXS :—Welw. Lusit. 1. 125. Spruce Amaz. 91. Schær. 558. Maudon 19. Larbal. 16. Leight. 261.
GEOG. DISTRIB :—W. Europe, Africa, Tropical Asia, Polynesia, Australasia, N. Zealand.
BOT. PROV :—1, 2...31.
ENGLAND—Devonshire. *Mr. Hudson.* Ryde, Isle of Wight ! *Rev. A. Bloxam.*
CHANNEL ISLANDS :—Sark ! Island of Brichou. *Mr. Larbalestier.* Scilly Islands. *Rev. T. Salwey.* Jerbourg. *Mr. Lukis.* on rocks north of the Eperquerie, Sark. *Rev. T. Salwey.* Jerbourg, Guernsey. *Mr. Collings.* Scilly Islands ! *Mr. Curnow.*

## III. RICASOLIA, (*D.N.*)

Thallus lobate or laciniate, affixed by fasciculate rhizinæ. Cyphellæ none. Stratum gonidiale consists of small yellow-green gonidia. Spermogonia in mastoid prominences.

1. *R. amplissima*, (Scop.) *pallido-glaucescent, coriaceous, orbicular, laciniato-lobate, sinuato-lobulate, rugulose, glomuliferous*, under surface pale brown and *tomentose, rhizinæ fuscescent ;* apothecia rufous, receptacle *granulato-furfuraceous*, margin *inflexed* ; spores elongato-fusiform, 1-3-septate. (medulla K—C—).

On trees, not common.

SYN :—Scop. Carn. 2. p. 386. (1772). *glomuliferu*, Lightf. Nyl. Syn. 368. Mudd Man. 91.
FIG :—E. Bot. 293. Mich. Gen. t. 46. Dill. t. 26. f. 91. Hepp Sporen t. 68. f. 594.
EXS :—Hepp 594. Leight. 110. Schær. 559. M. and N. 346. Anzi Langob. 372. Mass. 105. Larbal. 62.

GEOG. DISTRIB :—Europe, Algeria, N. America, Asia.

BOT. PROV :—1 .. 5, 6, 7...11, 12.. 14, 15, 16...19...30, 31.

ENGLAND :—Llanforda near Oswestry, Shropshire. *Rev. T. Salwey.* Sedbergh, Westmoreland. *Mr. Stanger.* near Middleton, Teesdale. *Mr. W. Brunton.* near Launceston. *Messrs Turner and Sowerby.* Hishope and Horsleyhope Denes, Durham; East Common Wood near Hexham, Northumberland. *Mr Winch.* Romaldkirk. *Rev. J. Harriman.* between Lustleigh Cleve and Moreton, Devon. *Mr Parfitt.* Widdecombe-in-the-Moor; W. side of Chagford; Manaton; Bagtor and Horidge near Ilsington ; Brentor near Tavistock; Bottor Rock, near Hennock, Devon. *Messrs. Jones and Kingston.*

SCOTLAND :—Moncrieff Hill, Perth. *Dr. Lindsay.* near Aberfeldy, Perthshire, *Mr. H. Macmillan.* near Inverary. *Messrs. Turner and Hooker.* Pentland Hills. *Mr Maughan.* Humby Woods. *Dr. Greville.* Lundie Craigs. *Mr. W. Gardiner.* Clova. *Mr. G. Don.* near Killin. *Dr. Holl.* Barcaldine, Appin. *Rev. J. M. Crombie.*

IRELAND :—Co. Antrim. *Dr. Moore.* Dinis Island, Killarney. *Mr. Carroll.*

WALES :—Hafod, Cardiganshire. *Sir J. E. Smith.* Corsygedol near Barmouth. *Rev. T. Salwey.*

CHANNEL ISLANDS :—Jerbourg, Guernsey. *Rev. T. Salwey.* Cliffs between Lozel and Boulay Bay, Jersey; Sark! *Mr. Larbalestier.*

"Spores .009 to .012 in. long, .00125 to .0015 in. broad." (*Mudd*) "Spores .037—62 mm. long, .006—7 mm. broad." (*Nyl.*)

The glomerules are identical with *Leptogium bolacinum*, Nyl. see Flora 1876. p. 578.

2. *R. lætevirens*, (Lightf.) *pale brown, membranaceous, rugulose, crowdedly lobate, rotundato-crenate and undulate*, under surface pale, and tomentose, *rhizinæ pale ;* apothecia rufous, receptacle *granulato-rugulose*, inflexed ; spores colourless or pallido-fuscescent, fusiform, 1-3-septate; (medulla K—C—).

On trees and rocks, not common.

SYN :—Lightf. Scot. p. 852. *herbacea*, Huds. Nyl. Syn. 369. Mudd Man. 91.

FIG :—E. Bot. 294. Hffm. Pl. L. t. 10. f. 2. Nyl. Syn. t. 1. f. 6. & t. 8. f. 46.

EXS :—Hepp 593. Leight. 75. Schær. 560. Welw. Lusit. 4. Maud. 28. Fries 334.

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—1, 2...5...7, 8...10...12...14, 15...19...22...26...30, 31.

ENGLAND :—Derbyshire and Westmoreland. *Sir J. E. Smith.* Baysdale, Cleveland ; *Mr. Mudd.* Charnwood Forest, Leicestershire! *Rev. A. Bloxam.* Helks Wood, Ingleborough. *Dr. Carrington.* Strath Braan Woods, Dunkelk, and near Thirsk. *Mr. J. G. Baker.* Hackfall, near Ripon. *Mr. W. Brunton.* Sedbergh, Westmoreland. *Mr. S. Slinger.* Bringewood Hill opposite Downton Castle. *Rev. T. Salwey.* Horsleyhope and Bishope Denes; Shipley Wood near Eglestone, Durham. *Mr. Winch.* Irehope Denes ; Weardale, Durham. *Sir W. C. Trevelyan.* Healey Field, Durham. *Mr. Waugh.* Shanklin, Isle of Wight; and S. Devon and Cornwall, generally. *Dr. Holl.* Budleigh Salterton. *Dr. Dickie.* Bagtor Wood, Ilsington ; North Bovey ; Manaton ; Lustleigh ; Chagford ; near Berry ; Pomeroy Castle ; Bottor Rock near Hermock, Devon. *Messrs. Jones and Kingston.* Burnham Grove, Guestling, Sussex. *Rev. E. N. Bloomfield.*

SCOTLAND :—Drumlanrig Wood. *Mr. W. Stevens.* Auchendenny Woods. *Dr. Greville.* Auldbar. *Mr. W. Gardiner.* near Kinnaird. *Mr. A. Croall.* Clova. *Mr. G. Don.*

IRELAND :—Killarney. *Dr. Carrington.* near Cork. *Mr. Carroll.* Glenarm, Antrim, and Powerscourt, Wicklow. *Dr. Moore.* Derryclare! co. Galway. *Mr. Larbalestier.*

WALES :—Near Oswestry, but in Denbighshire! and Barmouth! Corsygedol. *Rev. T. Salwey.* near Beaumaris. *Rev. A. Bloxam.* Gwydir Woods! Bettws-y-coed, Dolgelley!

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Boulay Bay, Jersey. *Mr. Larbalestier.*

"Spores .007 to .009 in. long, by .00125 to .0015 in. broad." (*Mudd.*) "Spores .026—46 mm. long, .009—.012 mm. broad." (*Nyl.*)

## SUB-TRIBE II. IMBRICARIEI.

Thallus laciniate or laciniato-lobate. Apothecia with ellipsoid, rarely oblong, simple, colourless spores. Paraphyses indistinct. Spermogonia innate. Spermatia acicular, fusiformi-incrassulate at either apex, or long cylindrical and arcuate. (Nyl. Syn. t. 8. f. 48.)

### IV. PARMELIA. *Ach. Nyl.*

Thallus variously lobato-divided or laciniate, expanded, somewhat shining, medulla stuppeous. Apothecia scattered. Spores 8, ellipsoid, simple, small. Sterigmata 2-5-articulated. Spermatia acicular, fusiformi-incrassulate at the acute apices. (Nyl. Syn. t. 8 f. 47. e.)

#### A. *medulla of thallus* K—C—.

1. *P. caperata*, (L.) *flavescent or subtruncinacous*, dilated, lobato-incised, *rugose*, under surface black, paler at the margin, nigro-rhizinose; apothecia badio-rufescent, margin crenulate pulverulent; spores 8, colourless, ellipsoid, simple; thallus K *f* + C + medulla K—C—.

On rocks and trees, common. 1696.

SYN:—Linn. Sp. Pl. ed. 1. No. 41. (1753). Nyl. Syn. 376. Mudd Man. 161.
FIG:—E. Bot. 654. Hffm. Pl. L. t. 39. f. 1. Hepp Sporen t. 97. f. 854.
EXS:—M. and N. 255. Schaer. 377. Tuck. 75. Nyl. 31. Anzi It. S. 107. Hepp 854. Mudd 73. Mass. 20. Welw. Lusit. 80. Leight. 77. Bohl. 123. Stenh. 121. Larb. 63.
GEOG. DISTRIB:—Europe, Africa, Asia, America, Australasia.
BOT. PROV:—1, 2, 3, 4, 5, 6, 7, 8...10, 11, 12...14...19...31.
ENGLAND:—Near Penzance and Camelford, Cornwall. *Messrs. Sowerby and Turner.* Lounsdale and Kildale! Cleveland. *Mr. Mudd.* New Forest. *Rev. J. M. Crombie.* Ryde, Isle of Wight! *Rev. A. Bloxam.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Keswick, Cumberland. *Mrs. Stanger.* near Lewes, Sussex. *Mr. W. Unwin.* near Sedbergh, Kendal. *Mr. S. Slinger.* Wensleydale. *Mr. J. W. Watson.* Heddon-on-the-wall and West Dipton, near Hexham, Northumberland. *Mr. Winch.* Romaldkirk. *Rev. J. Harriman.* near Totness; Bradley Wood, Newton Bushell. *Dr. Holl.* Ashburton, Devon. *Mr. Ralfs.* Lustleigh Cleve, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Market Rasen! Lincolnshire (in fruit). *Dr. F. A. Lees* .Haughmond Hill! Nesscliffe Hill! Shropshire.
SCOTLAND:—Pentland Hills. *Rev. J. M. Crombie.*
IRELAND:—Castlebernard Park, Bandon! *Mr. E. Fisher.* Dunkerron Mountains; Tralee. *Dr. Taylor.* near Cork. *Mr. Carroll.*
WALES:—Glyn! near Capel Curig. Gwydir Woods! Bettws-y-coed! Dolgelley! Fishguard! Pembrokeshire! Barmouth!
CHANNEL ISLANDS:—Jersey, Sark, Herm, Jethou! *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*
"Spores .00375 to .004 in. long, by .00125 in. broad. t. 2. f. 30." (*Mudd.*) "Spores .017—20 mm. long, .007—.010 mm. broad." (*Nyl.*) "Spores .017—20 mm. long, .007—10 mm. broad." (*T. M. Fr.*)

2. *P. olivacea*, (L.) *olivaceo-fuscous*, orbicular or sub-orbicular, smooth, or *minutely corrugate*, or sometimes varnished, *laciniato-lobate, lobes appressed*, plane, *crenate, sub-opake*, under surface concolorous; apothecia badious or badio-rufescent, margin entire; spores 8, colourless, elliptical, simple; medulla K—C—.

On trees, palings, &c. 1690.

SYN :—Linn. Sp. Pl. ed. 1. (1753). Ach. Syn. 200. Nyl. Syn. 395. Mudd Man. 99.
FIG :—E. Bot. 2180.
EXS :—Fellm. 81. Reich. and Schub. 89.
GEOG. DISTRIB :—Europe, Africa, America, Asia, Australasia.
BOT. PROV :—1...3, 4, 5...7...11...14, 15...(19—30)...31.
ENGLAND :—Berwick-on-Tweed ! *Dr. G. Johnston*. Northumberland and Durham. *Mr. Winch*. Kelvedon, Essex, *Mr. Varenne*. Devonshire. *Mr. Parfitt*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Bedford. *Rev. C. Abbot*. Guestling, Sussex. *Rev. E. N. Bloomfield*. near Shrewsbury ! Stiperstones ! Bomere ! Haughmond Hill ! Shropshire.
SCOTLAND :—Craigcrook, Colinton and Swanston Woods. *Mr. Maughan*. Braid Hermitage. *Dr. Greville*. Reeky Linn ; Airlie ; Camperdown ; Hare Craigs ; Clova. *Mr. W. Gardiner*.
IRELAND :—Common. *Dr. Taylor and Mr. Carroll*.
WALES :—Gwydir woods ! Bettws-y-coed.
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey*. common on all the islands. *Mr. Larbalestier*.
"Spores .002 in. long, by .00125 in. broad." *(Mudd.)* "Spores .011—19 mm. long, .007—.010 mm. broad." *(Nyl.)* "Spores .010—18 mm. long, .007—10 mm. broad." *(T. M. Fr.)*

Var. *exasperata*, (Ach.) thallus and receptacle *minutely papillato-exasperate ;* medulla white K—C—.

On trees.

SYN :—Ach. Syn. 320. (1817). Nyl. Syn. 396.
FIG :—Vaill. Paris. t. 20. f. 8.
EXS :—Mass. 13. Mudd 72. Anzi It. S. 115. M. and N. 161. Leight. 263. Arn. 581. Schær. 370. right hand specimen 356.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5...7...10...15, 16...19...26.
ENGLAND :—Ayton, Cleveland ! *Mr. Mudd*. Pembridge, Herefordshire ! *Rev. J. F. Crouch*. near Worcester. *Dr. Holl*. Eastbourne. *Mr. Roper*. Bomere Pool ! near Shrewsbury ! Wilcot ! Shropshire.
SCOTLAND :—Loch Awe. *Rev. J. M. Crombie*. Fort Augustus, Caledonian Canal. *Dr Lindsay*.
IRELAND :—Glencar, co. Kerry ; Glena ; Base of Mangerton, Killarney. *Mr. Carroll*. Killery Bay ! Connemara. *Mr. Larbalestier*.
WALES :—Dolgelley. *Dr. Holl*.
"Spores .009—.012 mm. long, .007—.010 mm. broad." *(Nyl.)*

Var. *prolixa*, Ach. dark olivaceous, sub-orbicular or effuse, *laciniate*, *laciniæ narrow*, variously divided, *multifid*, plane, *crenato-incised*, under surface nigricant, fibrillose ; medulla white K—C—.

On rocks, not unfrequent.

SYN :—Ach. Meth. 214, (1803). Nyl. Syn. 396.
FIG :—Hepp Sporen t. 82. f. 715.
EXS :—Anzi It. S. 116. Schær. 372. Leight. 291. Hepp 715.
GEOG. DISTRIB :—Europe, Algeria, Asia, Australasia.
BOT. PROV :—1...6, 7...15...19...23...26.
ENGLAND :—Torquay, Ilsham ! *Dr. Deakin*. Whitesand Bay, Cornwall ; Wembury, S. Devon. *Dr. Holl*.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie*.
IRELAND :—Howth. *Dr. Moore*. Mizen Head, *Mr. J. Wright*. Kilkee. *Mr. Carroll*. south of Ireland. *Miss Hutchins*. Cleghan ! Connemara, *Mr. Larbalestier*.
WALES :—Barmouth ! Fort Hill ! near Fishguard, Pembrokeshire.
"Spores .009—.011 mm. long, .005—6 mm. broad." *(Nyl.)* "Spores .009—12 mm. long, .005—6 mm. broad." *(T. M. Fr.)*

Var. *dendritica*, (Pers.) castaneo-fuscous, or badio-nigricant, stellato-orbicular, appressed, laciniæ narrow, imbricated, variously divided, multifid, subteretely convex, flexuose, incurved, under surface nigricant.

On rocks, not unfrequent.

SYN :—Persoon in Acta Soc. Wetterav. 2. p. 16.
EXS :—Leight. 365.
ENGLAND :—North Hill ! Malvern. *Mr. Lees.* Caer Caradoc ! Shropshire.
WALES :—Moel-y-Golfa ! Montgomeryshire.

3. *P. stygia*, (L.) castaneo-fuscous or pitch-black, somewhat shining, orbicular, firm, laciniæ *sublinear, multifid*, plane or convex, imbricate, divided, under-surface black or spadiceous towards the margins, rhizinæ few ; medulla white K—C— ; apothecia fuscous, *margin granulato-crenate ;* spores 8, colourless, elliptical, simple.

On alpine rocks. 1793.

SYN :—Linn. Sp. Pl. ed. 1. No. 23. (1753). Ach. Syn. 204. Nyl. Syn. 397. Mudd Man. 100.
FIG :—E. Bot. 2048. Hffm. En. t. 14. f. 2. Hepp Sporen t. 67. f. 587.
EXS :—Hepp 587. Fr. 166. 337. Anzi It. S. 111. Tuck. 17. Dicks. 25. M. and N. 351. Schær. 255. Nyl. Pyr. or. 17.
GEOG. DISTRIB :—Europe, N. America.
BOT PROV :—7...11...15 ..26.
ENGLAND :—Butsfield Moors, Durham. *Mr. Winch.*
SCOTLAND :—Highlands of Scotland. *Mr. Dickson.* (1793). Ben Nevis. (4406 ft.) ! Ben Mac Dhui, Braemar. (4296 ft.) *Dr. Lindsay.* Caintochan, Clova ; *Mr. R. Jacob.* Ben More, Breadalbane ; Lochnagar, Braemar, *Rev. J. M. Crombie.*
IRELAND :—(f. minor,) Mayo. *Dr. Moore.*
WALES :—Llandegley Rocks. *Rev. T. Salwey.*
"Spores .0015 in. long, by .00075 to .001 in. broad." *(Mudd.)* "Spores .008—.010 mm. long, .006—7 mm. broad." *(Nyl.)* "Spores .008—10 mm. long, 005—7 mm. broad." *(T. M. Fr.)*

4. *P. physodes*, (L.) *whitish, substellate*, laciniæ *multifid, plane*, glabrous, smooth, imbricate, under surface naked, rugose, fuscous-black, *apices inflated* and badio-pallescent ; K yellow C yellow, medulla white K—C— ; apothecia spadiceous or badio-rufescent, margin entire ; spores 8, colourless, oblong, simple, small.

On trees, rocks, &c., common. 1724.

SYN :—Linn. Sp. Pl. ed. 1. No. 26. (1753.) Ach. Syn. 218. Nyl. Syn. 400. Mudd Man. 96.
FIG :—E. Bot. 126. Hepp Sporen t. 67. f. 584.
EXS :—Fellm. 75. Hepp 584. Anzi Langob. (right hand spec.) 257. A. Fr. 291. Leight. (left hand spec.) 48.
GEOG. DISTRIB :—Throughout the world.
BOT. PROV :—1...3, 4, 5...7, 8...10, 11...14, 15, 16 ..19, 20 ..30, 31.
ENGLAND :—Cromford Moor near Matlock. *Sir J. E. Smith.* Lamberton Moor ! Blachadder plantations ! Berwick-on-Tweed. *Dr. G. Johnston.* Cambridge. *Rev. R. Relhan.* Moor Park, Herefordshire. *Rev. T. Salwey.* Castle Howard, Yorkshire. *Mr. Teesdale.* Gateshead Fell, Durham. *Mr. Winch.* Lustleigh Cleve. Devon. *Mr. Parfitt.* Colne ; Braxter ; Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Linwood Warren ! Lincolnshire. *Dr. F. A. Lees.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Wrekin Hill, Shropshire !
SCOTLAND :—Loch-na-Gat Glen, Ben Lawers (in fruit) ! *Mr. McKinlay.* Garrynahine, Lewis ; Knockhill Crieff ! fr. *Dr. Lindsay.* near Dumfries (in fruit). *Dr. Richardson.* Pentland Hills. *Mr. Maughan.* Cathkin Hills. *Mr. Hopkirk.* Swanston Woods (fruit). *Dr. Greville.* Baldovan and Deerhill Woods ; Camperdown ; Auchter House ; Auldbar. *Mr. W. Gardiner.* near Kinnaird. *Mr. A. Bousie.* Arran. *Prof. Balfour.* near Carnbo, at foot of the Ochils, Kinrosshire (fruit). *Dr Nichol.*
IRELAND :—Near Belfast (fruit). *Mr. Templeton.* Powerscourt Water Fall. *Mr G. S. Gough.* Glenbower, Killeagh. *Mr. Carroll.*
WALES :—Cwmbychan (fruit). *Rev. T. Salwey.* near Llyn Aran, Cader Idris. *Dr. Holl.* Gwydir Woods ! Bettws-y-coed. Llyn Geirionydd !

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey and Sark. *Mr. Larbalestier.*

"Spores .0015 to .002 in. long, .00075 to .001 in. broad." (*Mudd.*) "Spores .006—8 mm. long, .005—6 mm. broad." *(Nyl.)* "Spores .006—8 mm. long, .005—6 mm. broad." *(T. M. Fr.)*

Var. *vittata*, Ach, *laciniæ* of thallus narrow and linear, *denigrate at the margins.*

On trees, not common.

SYN :—Ach. Meth. 251. (1803). Syn. 218. Nyl. Scand. 103. Mudd Man. 96.
EXS :—Fellm. 76. Schær. 367.
GEOG. DISTRIB :—Switzerland, Italy, Scandinavia.
BOT. PROV :—7...15.
SCOTLAND :—Highlands, frequently. *Dr. Holl.*
WALES :—Dolgelley. *Dr. Holl.*

Var. *recurva*, Leight. like the type, but *apices* of laciniæ *recurved and albo-sorediate.*

On trees and rocks, common.

FIG :—E. Bot. 126. upper fig. 1. 3.
EXS :—Nyl. 113. Mudd 70. Reich. and Schub. 65.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...10...12...15.
ENGLAND :—Hay Park, Herefordshire (fruit)! *Rev. T. Salwey.* High Cliff! and Lounsdale! Cleveland. *Mr. Mudd.* Keswick, Cumberland (fruit) *Mrs. Stanger.* Nesscliffe Hill! Wrekin Hill! Long Mynd! Stiperstones! Shropshire.
SCOTLAND :—Loch-na-Gat stream, Ben Lawers (fruit)! *Mr. A. McKinlay.*
NORTH WALES :—Barmouth!

Var. *labrosa*, Ach. *apices* of laciniæ sub-cylindrical, *turgescent, tuberculoso-albo-sorediate.*

On trees, &c., common.

SYN :—Ach. L. U. 492. (1810). Nyl. Syn. 401. Mudd Man. 97.
FIG :—Hffm. Enum. t. 15. f. 2. E. Bot. 126. fig. 5.
EXS :—Arn. 297. Mass. 278. Bohl. 13. Leight. 48. (right hand spec). Hepp 856. Rabh. 793.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...(13—18).
ENGLAND :—Malvern Hills, Worcestershire. *Sir J. E. Smith.* Pentre-noon, Monmouth. *Dr. Holl.* near Cirencester. *Mr. W. Joshua.* Wrekin Hill, Shropshire!
SCOTLAND :—frequent. *Rev. J. M. Crombie.*
WALES :—Gwydir Woods! Bettws-y-coed (fruit).

Var. *platyphylla*, Ach. *orbicular*, laciniæ smooth, glabrous, *broader, turgid and undulate*, and spermogoniferous towards the centre, *appressed, rounded and crenate* at the circumference.

On rocks, not common.

SYN :—Ach. Meth. 251. (1803) Syn. 219. Nyl. Syn. 400.
EXS :—Schær. 366. M. & N. 159.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5..7...10, 11...15...20.
ENGLAND :—Snailesworth! *Mr. J. G. Baker.* Yorkshire! *Mr. G. Dickson.* Waskerley Bourn and Welsingham Park, Durham. *Mr. Winch.*
SCOTLAND :—Blaeberry Hill, Perth! *Dr. Lindsay.*
IRELAND :—Near Cork! *Mr. J. Carroll.*
NORTH WALES :—Pentregaer near Oswestry! *Rev. T. Salwey.* Llyn Geirionydd! Cwm Ffynnon Llugwy!

Var. *encausta*, (Sm.) *albido-cinerascent*, nearly fuscescent, *narrowly laciniate*, unequal, *laciniæ multifid, convex, or terete*, imbricato-

decumbent or depressed, under surface nigricant, opake; apothecia badio-rufous, margin crenulate; medulla white K—C—.

On alpine rocks, rare. 1791.

SYN :—Sm. in Trans. Linn. Soc. 1. p. 83. (1791). Ach. Syn. 206. Nyl. Syn. 401.
FIG :—Trans. Linn. Soc. 1. t. 4. f. 6. Hffm. Pl. L. t. 32. f. 2. Hepp Sporen t. 7. f. 52.
EXS :—Schær. 368. Fr. 338. Anzi It. S. 106. Zw. 183. Hepp 52. M. and N. 353.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Cairntoul; Ben Lawers; Ben More; Morrone. *Rev. J. M. Crombie.*
"Spores .007—.010 mm. long, .005—8 mm. broad." *(Nyl.)* "Spores .007—.010 mm. long, .005—7 mm. broad." *(T. M. Fr.)*

Var. *obscurata*, Ach. *fusco-nigricant but fusco-olivaceous at the circumference*, shining, rugoso-plicate, *laciniæ broad, subinflated, nigro-fuscous at the margins.*

On old pales in maritime districts. 1875.

SYN :—Ach. Syn. 218.
EXS :—Hepp 585. Anzi Langob. 257 B.
GEOG. DISTRIB :—Arctic America, Switzerland, Italy.
BOT. PROV :—3...17.
ENGLAND :—Lydd, Kent. *Rev. J. M. Crombie.* (1875).
SCOTLAND :—Near Nigg, Kincardineshire. *Rev. J. M. Crombie.*

5. *P. alpicola*, Th. Fr. *nigro-olivaceous, crustaceo-cartilaginous*, orbicular or expanded, sub-opake, *laciniæ* convex, *rugoso-plicate*, imbricate and complicate, *narrow, toruloso-intricate*, apices incurved, under surface very black, sparsely fibrillose; medulla white K—C—; apothecia nigricant, concave, margin entire; spores 8, colourless, ellipsoid or sub-globose, simple.

On alpine rocks.

SYN :—*Parmelia alpicola*, Th. Fr. Lich. Arctoi 57. (1860), Lich. Scand. 125. *Parmelia encausta, var. stygioides*, Linds. Tr. Roy. Soc. Edin. 22. p. 224.
FIG :—E. Bot. t. 2049.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Ben Nevis. *Dr. Stuart.* Cairngorm, Braemar. *Dr. Lindsay.* (1856). Morrone, Ben-na-boord; Ben More; Breadalbane. *Rev. J. M. Crombie.*
"Spores .007—12 mm. long, .005—9 mm. broad." *(T. M. Fr.)*

6. *P. ambigua*, (Wulf.) *stramineous, stellato-orbicular, appressed, laciniæ* narrow, applanate, multifid, *flavo-sorediate*, under surface fuscous-black; apothecia rufo-badious or badio-fuscescent, margin sub-entire; spores 8, colourless, oblong or ovoideo-oblong, curved, simple; thallus K—C+, medulla white K—C—.

On fir trees, posts, &c. 1808,

SYN :—Wulf. in Jacq. Coll. 4. 239. (1790) Ach. Syn. 208. Nyl. Lich. Scand. 105. Mudd Man. 103.
FIG :—E. B. Suppl. 2796. (the yellow figures) Hffm. Pl. L. t. 40. f. 2. 3. 4. t. 42. f. 2. 3. Hepp Sporen t. 98. f. 858.
EXS :—Anzi Langob. 52. Fellm. 84. Hepp 858. Schær. 375. M. and N. 449. Mudd 75. Leight. 373. Stenh. 124.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—5...7, 8, 9, 10...15.
ENGLAND :—Gopsall Park, Leicestershire! *Rev. A. Bloxam.* Pentregaer near Oswestry! Hay Park near Ludlow. *Rev. T Salwey.* Ingleby Greenhow! Hoggarts Wood, Cleveland. *Mr Mudd.* Clougha, Lancashire. *Mr. R. Jacob.*

SCOTLAND :—Larig Crue under Cairngorm. *Mr. Borrer.* (1808). Marr Forest. *Mr. G. Don.* Northern Forest of the Highlands; Kinnordy, Forfarshire. *Sir W. J. Hooker.* Cairngorm. *Messrs. Borrer and Hooker.* Glen Derry. *Rev. J. M. Crombie.*

WALES :—Cwmbychan near Barmouth, and Powis Castle Park. *Rev. T. Salwey.*

"Spores .006–11 mm. long, .0025—.0035 mm. broad." *(Nyl.)*

7. *P. cetrarioides*, Del. *glauco-albescent*, subcoriaceous, orbicular, *lobes rotundate, margin rotundo-crenate, elevated, crisped; medulla K—C—;* apothecia badio-rufous, margin entire; spores 8, colourless, ellipsoid, simple.

On trees and stones, frequent. 1869.

SYN :—*P. perlata var. cetrarioides*, Delise in Duby Bot. Gall. 601. (1829). Nyl. in Flora 1869. p. 290. Crombie En. 34.
EXS :—Arn. 582. Hepp. 578.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5...7...13...15...31.
ENGLAND :—New Forest. *Rev. J. M. Crombie.* Cotteswold Hills. *Mr. W. Joshua.*
SCOTLAND :—Loch Lomond! *Dr. Stirton.* New Galloway! *Mr. W. Andrew.*
WALES :—Dolgelley! Barmouth! *Dr. Holl.* (1869). Capel Curig! Drwsynant!
CHANNEL ISLANDS :—Near Rozel, Jersey! *Mr. Larbalestier.*

8. *P. hyperopta, (Ach.)* albido-cinerous, membranaceous, closely adherent, laciniato-lobate, *central lobes somewhat convex, rugoso-plicate; soredia roundish, elevated, albo-pulverulent;* lobes of the circumference linear, plane, naked; medulla K—C—; apothecia scattered, brown and shining, margin crenulate; spores 8, colourless, linear-oblong, simple, *curved, lunulate or falcate*, minute.

On pine trees, rare. 1808.

SYN :—Ach. Syn. 208. Korb. Syst. L. Germ. 73.
FIG :—Nyl. Scand. t. 1. f. 1. E. B. Suppl. 2796. (white figures).
EXS :—Anzi Langob. 51. Fellm. 85.
GEOG. DISTRIB :—Sweden, Austria, Italy, France, East Lapland.
BOT. PROV :—15
SCOTLAND :—Forest of Rothiemurchus. *Mr. Borrer.* (1808). Glen Dee, Braemar. *Rev. J. M. Crombie.*

Well distinguished from *P. aleurites*, with which it has been heretofore confounded, by the round separated soredia, and the curved spores, and different reaction, the entire central portion of the thallus in *P. aleurites* being sorediate.

"Spores .011—12 mm. long, .003—4 mm. broad." *(Nyl.)*

9. *P. reddenda*, Stirt., precisely similar externally both in colour and albo-soredioid points to *P. Borreri*, Turn. but the *medulla K—C—;* under surface black, spadiceous at the circumference, rugulose; rhizinæ black, nigricant, or even sometimes pallid.

On rocks and trees, probably not uncommon but overlooked, sterile. 1871.

SYN : -Stirton in Scottish Naturalist, July, 1878. p. 298.
BOT. PROV :—7...13.
SCOTLAND :—Near New Galloway! *Mr. J. M. Andrew.*
WALES :- Glyn, near Capel Curig! (1871).

B. *medulla of thallus* K *yellow* C—.

10. *P. perlata*, (L.) *albo-glaucescent or whitish*, dilated, lobate, lobes rotundate, subimbricate, *often albo-sorediate on the margins*, under surface fuscous-black or black, and pale towards margins; K + C +, medulla K yellow C—; apothecia badio-rufous, margin entire; spores 8, colourless, ellipsoid, simple.

On trees (rare in fruit.) 1741.

SYN :—Linn. Syst. Nat. ed. 12. p. 712. (1767). Ach. Syn. 197. Nyl. Syn. 379. Mudd Man. 92.

FIG :—E. Bot. 341.

EXS :—Hepp 579. 580. Zw. 185. Fr. 335. M. and N. 253. Leight. 76. 392. Anzi Langob. 48. Rabh. 912.

GEOG. DISTRIB :—Throughout the World.

BOT. PROV :—1, 2, 3, 4, 5, 6, 7...10...13...15...19, 20...26...31.

ENGLAND :—Penzance, Cornwall; Stoke Wood, Devonshire; *Mr. Parfitt.* near Lewes, Sussex. *Mr. W. Unwin.* near Ilfracombe. *Miss M. Atwood.* Helks Wood, Ingleborough. *Dr. Carrington.* Bousdale Gill, Cleveland. *Mr. Mudd.* between Camelford and Bodmin; near Ilfracombe. *Messrs. Turner & Sowerby.* Kelveden; Inworth; Easthorpe, Essex. *Mr. Varenne.* Stoke Wood, Exeter. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Oxford. *Dillenius.* (1741). Cambridge. *Rev. R Relhan.* Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Haughmond Hill! Shropshire.

SCOTLAND :—Kinnoul Hill, Perth; Caerlaveroch Road, Dumfries; Quiraing, Skye. *Dr. Lindsay.* S.W. of Scotland. *Rev. J. M. Crombie.*

IRELAND :—Fermoy! *Mr. T. Chandler.* near Cork! and near Knockmore. near Carregaline, Cork. *Mr. Carroll.* near Dunkerron. *Dr. Taylor.* near Lough Corrib, Galway. *Dr. Moore.* Killery Bay! Letterfrack! co. Galway. *Mr. Larbalestier.*

WALES :—Hafod, Cardiganshire. *Sir. J. E. Smith.* Barmouth (in fruit). *Rev. T. Salwey.* Glyn near Capel Curig! Gwydir Woods! Bettws-y-coed. Trefriw!

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

"Spores .0025 to .003 in. long, by .007—.010 mm. broad." *(Mudd.)* "Spores .011—17 mm. long .007—.010 mm. broad." *(Nyl.)*

Var. *ciliata*, DC. thallus nearly naked beneath, and *nigro-ciliate* at the margins, (medulla K yellow C—.)

On trees and rocks. 1812.

SYN :—DC. Fl. Fr. 2. p. 403. (1805.) Nyl. Syn. 380.

FIG :—E. Bot. 2423.

EXS :—Welw. Lusit, 75. 77. 81. Zw. 56. Anzi It. S. 100. 101. Arn. 136. Larb. 17.

BOT. PROV :—1, 2...7 ..16...19...26...31.

ENGLAND :—Sussex. *Mr. Borrer.* Bolt Head and Dartmoor, S. Devon. *Dr. Holl.*

SCOTLAND :—Crinan Canal, Argyleshire! *Dr. Lindsay.*

IRELAND :—Castlebernard Park. Bandon! *Mr. Carroll.* Dunkerron. *Dr. Taylor.* Ballinahinch! near Kylemore! co. Galway. *Mr. Larbalestier.*

WALES :—Barmouth! *Rev. T. Salwey.* Dolgelley. *Dr. Holl.* Glyn, near Capel Curig!

CHANNEL ISLANDS :—E. coast of Jersey! and Guernsey. *Mr. Larbalestier.*

Forma *dissectula*, Nyl. margins of thallus *minutely multifido-dissected* Killery. Bay. *Mr. Larbalestier.* 1876.

11. *P. pertusa*, (Schrank.) whitish, *orbicular*, *plano-appressed*, glabrous, laciniæ narrow, *multifid*, sinuate, convex, somewhat shining, *minutely perforated*, apices dilated, crenato incised, sometimes sorediate, under surface black and rugose; apothecia rufo-fuscescent, margin entire, inflexed; spores colourless, 2—4, broadly elliptical, simple, large. (medulla white K yellow C—.)

On rocks and trees, rare in fruit. 1800.

SYN :—Schrank. Bayer Fl. 2. No. 1513. (1789.) Ach. Syn. 219. Nyl. Syn. 402. Mudd Man. 97.

FIG :—E. Bot. 1248. Hepp Sporen t. 97. f. 857.

EXS :—Zw. 252. Leight. 264. Hepp 857. Anzi 105. Tuck. 16. Schær. 365. Nyl. 32. M. & N. 65. Larbal. 66.

GEOG. DISTRIB :—Europe, Asia, America, Australasia.

BOT. PROV :—1...7...16...19...26...30, 31.

ENGLAND :—Lynton, Devon. *Rev. J. M. Crombie.* near Bovey village, Devon. *Messrs. Jones and Kingston.*

SCOTLAND :—Ballacheulish in Appin (in fruit) *Messrs. Turner and Hooker.* Glencroe! *Dr. Macmillan.*

IRELAND :—Dunkerron Mountains. *Dr. Taylor.* Pass of Keirn-na-Eigh, co. Cork; Glenmore Lake, Kerry; Eagle's Nest, Killarney. *Mr. Carroll.* Cushendun, co. Antrim. *Dr. Moore.* near Letterfrack! *Mr. Larbalestier.*

WALES :—Beddgelert. *Mr. D. Turner.* (1800). Cwmbychan; rocks above Hendremynach; and on alder trees at Nannau. *Rev. T. Salwey.* Garth near Dolgelley. *Dr. Holl.* Barmouth!

CHANNEL ISLANDS :—Bonne Nuit, Jersey! *Mr. Larbalestier.*

"Spores .0045—60 mm. long, .022—28. broad." (*Nyl.*) (*T. M. Fr.*)

C. *medulla of thallus white, tinged red by C alone.*

12. *P. olivetorum*, (Ach.) externally similar to the sorediate states of *P. perlata*, but distinguished by chemical reaction of the white medulla, which is tinged red by C alone.

On rocks, rare.

SYN :—Ach. Meth. 217. (1803.) Syn. 198. Nyl. Lapp. Or. 180.
FIG :—Dill. t. 20. f. 39. B. Hepp Sporen t. 66. f. 578.
EXS :—Tuck. 15. Anzi It. S. 99. Fries. 335. Hepp 578. Zw. 185.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—2.
ENGLAND :—Danny, Sussex, in herb. Hooker, determined by Dr. Nylander.
"Spores .014—18 mm. long, .007—.012 mm. long." (*Nyl.*)

13. *P. tiliacea*, (Ach.) glaucescent, *sub-orbicular*, laciniato-lobate, *laciniæ rotundate*, smooth, margins *sinuato-crenate;* apothecia badio-rufescent, chiefly in the centre of the thallus, receptacle smooth, margin nearly entire; spores 8, colourless, oblong, simple; medulla white C red.

On trees &c. 1791.

SYN :—Ach. Meth. 215. Nyl. Syn 382. Mudd Man. 93.
FIG :—E. Bot. 700. Hepp Sporen t. 97. f. 855.
EXS :—Mass. 326. 327. Anzi It. S. 102. Langob. 26. Larb. 18. Rabh. 929.
GEOG. DISTRIB :—Europe, Asia, Africa, N. America, Australasia.
BOT. PROV :—1, 2...5...7...31.
ENGLAND :—Dunster, Somersetshire. *Messrs. Turner and Sowerby.* Lynton, N. Devon! *Mr. Mudd.* near Torquay! *Dr. Deakin.* New Forest! St. Leonard's Forest! *Mr. Borrer.* near Cornworthy, S. Devon; Dartmoor! *Dr. Holl.* Budleigh Salterton! *Mr Carter.* Holne Chase. Buckland Woods; Spitchwick, Devon. *Messrs Jones and Kingston.* Foss Bridge near Cirencester. *Mr. W. Joshua.*

WALES :—Anglesea and Carnarvonshire. *Rev Hugh Davies.* Abergwynant, near Dolgelley! *Dr. Holl.* Gwydir Woods! Bettws-y-coed.

CHANNEL ISLANDS :—L'Etacq, Jersey! *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

"Spores .002 to .0025 in long, by .001 in. broad." (*Mudd.*) "Spores .007—.011 mm. long, .005—7 mm. broad." (*Nyl.*) "Spores .007—11 mm. long, .005—7 mm. broad." (*T. M Fr.*)

Var. *rugosula*, Leight. orbicular, *centre of thallus and base* of rotundate *laciniæ singularly transversely wrinkled;* medulla white C red.

On trees.

FIG :—Hepp Sporen t. 97. f. 855.
EXS :—Schær. 358. Zw. 53. Hepp 855.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...19.
ENGLAND :—Near Esher Bridge! *Mr. Borrer.* Chart Park, Dorking! *Mr. Jenner.*
IRELAND :—Banks of Blackwater river, co. Kerry. *Dr. Taylor.*

Var. *scortea*, (Ach.) orbicular, sinuato-lobate, *lobes* short, *rotund, undulate*, margin inciso-crenate, *centre of the thallus isidiiferous and pulverulent;* medulla white C red.

On trees, palings, &c. 1809.

SYN :—Ach. Prodr. 119. Nyl. Syn. 383. Mudd Man. 93.
FIG :—E. Bot. 2065.
EXS.—Anzi It. S. 103. Hepp 855. b. and 581. M. & N. 445. Mass. 328. Leight. 87. Schær. 359.
GEOG. DISTRIB :—Europe, S. America, Ceylon. Africa, Mauritius.
BOT. PROV :—1, 2..5, 6, 7...11..13...19...20...26...31.
ENGLAND :—Henfield! Sussex; Portnalls and on Farthing Down! Stonehenge! Livermere! *Rev. G. R. Leathes.* (1809). Little Stretton, Shropshire! *Rev. T. Salwey.* Staveley, Kendal! *Mr. J. A. Martindale.* Twycross, Leicestershire! Harbro' Magna! Warwickshire. *Rev. A. Bloxam.* Bolt Head, S. Devon! *Dr. Holl.* Foggerforth near Eglestone, Durham! *Rev. J. Harriman.* Haldon, Devon. *Mr. Parfitt.* Church Stretton! co. Salop.
SCOTLAND :—Caerlaverack, Dumfries! *Dr. Lindsay.*
IRELAND :—Ballymartle, co. Cork! *Mr. Carroll.* Askew Wood, co. Kerry! *Dr. Taylor.* Tully! Galway, *Mr. Larbalestier.*
WALES :—Holyland! and Barmouth, *Rev. T. Salwey.* near Dolgelley. *Dr. Holl.* Pen-y-rhu! near Fishguard. Forden! Montgomeryshire.
CHANNEL ISLANDS :—L'Etacq, Jersey! Guernsey. *Mr. Larbalestier.*

Var. *sublævigata*, Nyl. *pinnatifido-divaricate*, laciniæ *appressed*, linear, *narrow*, distinct, *sinuato-incised*, *apices truncato-furcate*, very *atro-rhizinose* beneath; medulla white C red.

On trees, &c.

SYN :—Nyl. Syn. 383. (1860).
EXS :—Spruce Amaz. 156.
GEOG. DISTRIB :—Europe, Central America.
BOT. PROV :—1, 2...19.
ENGLAND :—Bournemouth! *Rev. A. Bloxam.* near Exeter! *Prof. Dickie.*
IRELAND :—Dunkerron! *Dr. Taylor.*

Var. *concentrica*, Leight. *sphærico-conglomerate*, growing in involved *concentric* layers; medulla white C red.

On exposed downs, rare.

SYN :—Leight. Exs. 232.
FIG :—Gard. Chron. 1856. p. 84. and 172.
EXS :—Leight. 232.
GEOG. DISTRIB :—Europe.
ENGLAND :—Melbury Hill near Shaftesbury, Dorsetshire! *Sir W. C. Trevelyan.*
Dr. Holl in litt. says, "from Bolt Head I have a variety which approaches your *concentrica* but is isidiiferous."

14. *P. Borreri*, (Turn.) cinereo-glaucescent, becoming *pale brown when dry, appressed*, imbricate, rugulose, *albo-punctate or albo-sorediate*, lobes *broad and rotundate*, under surface fuscous or pallescent; apothecia badio-rufous, margin elevated, inflexed; spores 8, colourless, elliptical, simple; medulla white C red.

On trees and rocks. 1807.

SYN :—Turn. in Linn. Trans. 9. 148. (1808.) Ach. Syn. 197. Nyl. Syn. 389. Mudd Man. 94.
FIG :—E. Bot. 1780. Linn. Tr. 9. t. 13. f. 2. Mudd Man. t. 2. f. 29.
EXS :—Hepp 582. Schær. 361. Leight. 231. Larb. 20. Anzi Langob. 374. Zw. 251. M. and N, 634. Mass. 107. Wagner 13.
GEOG. DISTRIB :—Europe, Africa, Asia, America.
BOT. PROV :—1, 2, 3, 4, 5, 6, 7, 8...19, 20...22...26...31.
ENGLAND :—Sussex. *Mr. Borrer.* (1807.) Norwich and Coltishall. *Mr. D. Turner.* Twycross, Leicestershire! and near Braunston! *Rev. A. Bloxam.* Pen-

zance! Woodhill and Porkington near Oswestry! *Rev. T. Salwey.* Stanstead Park, Essex. *Mr. R. Jacob.* near Worcester; near Brighton; Isle of Wight. *Dr. Holl.* Tetsworth! Oxfordshire. *Mr. Larbalestier.* Hastings. *Mr. W. Joshua.* North Bovey, Ilsington, and Tor Abbey, Devon, *Messrs. Jones and Kingston.* Penzance! *Mr. Curnow.* Treveneth! Bomere Pool! Meole Brook! Stiperstones! Haughmond Hill! Nesscliff Hill! near Shrewsbury!

IRELAND:—Ballymartle, co. Cork! and Glanmire, Cork. *Mr. Carroll.* near Wicklow. *Dr. Maingay.* Dunkerron; Roughty, co. Kerry. *Dr. Taylor.* Kylemore. *Mr. Larbalestier.*

WALES:—Pembrokeshire! Lane between Glanmawddach and Bodowen near Barmouth. *Rev. T. Salwey.* Glyn! Capel Curig!

CHANNEL ISLANDS:—Rozel, Jersey! *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

"Spores .003 to .004 in. long, by .0015 to .002 in. broad." (*Mudd.*) "Spores .015—19 mm. long, .009—11 mm. broad." (*Nyl.*) Spores .017—.019 mm. long, .011—.012 mm. broad.

15. *P. fuliginosa*, (Dub.) badio-umbrine, orbicular, *laciniato-lobate*, lobes *appressed*, plane, crenate, *fuliginoso-furfuraceous or isidiose;* apothecia brown, margin *thick crenulate;* medulla C red.

On rocks frequent, and on trees less frequent.

SYN:—Dub. Bot. Gall. 602 (1829). Nyl. Syn. 397. Flora 1868. p. 346.
GEOG. DISTRIB:—Europe.
BOT. PROV:—4...5...7...12...15...20...26.
ENGLAND:—Burnside Lane near Staveley in Kendal, Westmoreland! *Mr. J. A. Martindale.* Norfolk! *Mr. D. Turner.* W. Hill, Malvern. *Mr. W. Joshua.* Long Mynd! Stiperstones! Pontesford Hill! Haughmond Hill! Lyth Hill! Shropshire.
SCOTLAND:—Birnam Hill, Dunkeld! *Dr. Lindsay.* Park near Aberdeen; Kincardineshire Coast, Castleton, Braemar! *Mr. Croall.* Forfarshire! *Mr. Drummond.*
IRELAND:—Near Cork! *Mr. Carroll.* Dawros River! and near Leonane! co. Galway. *Mr Larbalestier.*
WALES:—Between Corwen and Bala! Gwydir Woods! Bettws-y-coed; Trefriw! (corticole in fruit.) Capel Arthog!

Forma *olivacea*, Leight. *olivaceo-virescent*, like *P. olivacea*, (L) but *coraloideo-isidiiferous*, and with different reaction (medulla white C red),

On trees, very frequent, but sterile, rare on rocks.

SYN:—*P. Borreri, f. olivacea*, Leight. L. Fl. 2d. ed. p. 479.
EXS:—M. & N. 161 (upper specimen), Anzi It. S. 114. Rabh. 928. Anzi. 114.
GEOG. DISTRIB:—Switzerland, France.
BOT. PROV:—5, 6.
ENGLAND:—Throughout Shropshire!
WALES:—Bettws-y-coed! Glyn! near Capel Curig and throughout Montgomeryshire! Denbighshire! and Carnarvonshire!
Spores .016 mm. long, .011 mm. broad.

### D. *medulla of thallus K yellow then red.*

16. *P. perforata*, Wulf. whitish or glaucous-white, lobate or lobato-sinuate or sinuato-divided, smooth, *minutely reticulato-rimulose*, margin often albo-sorediate, under surface fuscous-black or black; apothecia badio-rufescent or fusco-rufous, often *medio-perforate*, margin entire; spores 8, colourless, elliptical, simple; medulla white K yellow then red.

On rocks and trees. 1836.

SYN:—Wulf. in Jacq. Coll. 1. 116. (1786). Ach. Syn. 198. Nyl. Syn. 377. *P. reticulata*, Tayl! in Mack. Fl. Hib. 148.
FIG:—Dill. Musc. t. 20. f. 44.
EXS:—M. & N. 253. Hepp 580. Schær. 360. in pt. Welw. Lusit. 75.

GEOG. DISTRIB :—Europe, Australasia, Ceylon, Mauritius, Jamaica.
BOT. PROV :—1...7...16...19...31.
ENGLAND :—Devonshire, *Messrs. Jones and Kingston*. Trercife Rookery! near Penzance. *Mr. Curnow*.
SCOTLAND :—Appin. *Rev. J. M. Crombie*.
IRELAND :—Near Dunkerron! *Dr. Taylor*.
WALES :—Dolgelley! *Mr. J. Ralfs*.
CHANNEL ISLANDS :—Near Fort Essex, Alderney! *Mr. Larbalestier*. Guernsey. *Rev. T. Salwey*.
"Spores .011—18 mm. long, .007—.011 mm. broad." *(Nyl.)* Spores .016 mm. long, .010 mm. broad.

Forma *ciliata*, Nyl. *margins* of thallus fimbriate *with black ciliæ*.

On rocks, rare.

SYN :—Nyl. Syn, 378.
FIG :—Jacq. Coll. 1. t. 3. Hoffm. Pl. Lich. t. 13.
GEOG. DISTRIB :—New Zealand, Australasia.
BOT. PROV :—26...31.
IRELAND :—Road to Recess! near Kylemore. *Mr. Larbalestier*.
CHANNEL ISLANDS :—Jersey! *Mr. Larbalestier*.

17. *P. conspersa*, (Ehrh.) *pale, ochroleucous, orbicular, laciniato-divided*, laciniæ appressed, contiguous or imbricate, margins sinuato-incised or crenate, undulate, under surface fuscous-black or fuscescent, nigro-fibrillose; apothecia spadiceous or fuscous, margin thin, inflexed; spores 8, colourless, ellipsoid, simple; thallus K f+ C+, medulla K yellow then red.

On rocks, &c., not uncommon. 1741.

SYN :—Ach. Prodr. 118. (1798.) Nyl. Syn. 391. Mudd Man. 102.
FIG :—E. Bot. 2097. Hffm. Pl. L. t. 16. f. 2.
EXS :—M. & N. 160. Schær. 379. Bohl. 110. Wright 77. Maudon 11. in part. Stenh. 122 in part. Anzi It. S. 108. Leight. 78. Larbal. 65.
GEOG. DISTRIB :—Throughout the World.
BOT. PROV :—1...5...7, 8...10, 11...13...15.. 31.
ENGLAND :—Oswestry, Shropshire! *Rev. T. Salwey*. Battersby Bank, Cleveland! *Mr. Mudd*. Charnwood Forest, Leicestershire. *Rev. A. Bloxam*. near Dunsford, Devonshire. *Mr. E. Parfitt*. Wensleydale. *Mr. J. W. Watson*. Teesdale, Durham. *Rev. J. Harriman*. Middleton-in-Teesdale, Durham! North Tyne near Warden Mill, Northumberland. *Mr. Winch*. Dartmoor; North Bovey and Ilsington; near Clifford bridge on Drewsteignton road; Bottor rock; Widdercombe-in-the-Moor, Devon. *Messrs. Jones and Kingston*. Bodbury Ring near Church Stretton! Wrekin! Corndon!
SCOTLAND :—Bield and Moffat. *Sir J. E. Smith*. Moffat, Dumfriesshire! Blaeberry Hill, Perth; Garrynahine, Lewis; *Dr. Lindsay*.
IRELAND :—On siliceous rocks, not uncommon. *Mr. Carroll*.
WALES :—Dolgelley; Llanberis. *Dillenius*. (1741.) Conway Mountain! Nant Francon! Bettws-y-coed! between Towyn and Craig Aderyn!
CHANNEL ISLANDS :—Jersey and Sark! and other Islands. *Mr. Larbalestier*.
"Spores .00175 in. long, .001 in. broad." *(Mudd.)* "Spores .008—12 mm. long, .005—8 mm. broad." *(Nyl.)* "Spores .001—12 mm. long, .005—7 mm. broad," *(T. M. Fr.)*

f. *stenophylla*, (Ach.) laciniæ of thallus *narrower*, much more divided and imbricate.

SYN :—Ach. Meth. 206. (1803.) Nyl. Syn. 391. Mudd Man. 102.
EXS: —M. and N. 940. Mass. 313. Anzi It. S. 109. Fellm. 79. Leight. 79.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5, 6, 7, 8...(13...18).
ENGLAND :—Craigforda near Oswestry, Shropshire! *Rev. T. Salwey*. Gopsall. Leicestershire! *Rev. A. Bloxam*. Dunsford, Devon. *Mr. Parfitt*. Wrekin, Shropshire!
SCOTLAND :—Common. *Rev. J. M. Crombie*.
WALES :—Fort Hill! near Fishguard, Pembrokeshire. Moel-y-Golfa!

f. *isidiata*, Anzi. centre of thallus densely *isidiose*.

SYN :—Anzi Cat. p. 28. (1860.)
EXS :—Mass. 314. Anzi It. S. 110. Leight. 79. Wright 77.
GEOG. DISTRIB :—Europe, New Zealand, Cuba.
BOT. PROV :—5...7...12, 13...26.
ENGLAND :—Keswick, Cumberland! *Mrs Stanger*. Wrekin, Shropshire!
SCOTLAND :—Caerlaverock Wood, Dumfries! *Dr. Lindsay*.
IRELAND :—Dawros River! co. Galway. *Mr. Larbalestier*.
WALES :—Barmouth! Llyn Geirionydd!

f. *Mougeotii*, Schær. laciniæ of the thallus very narrow multifid, somewhat convex, *closely adnate*, *sulphureo-sorediate*, dark and *sub-diffract* in the centre, paler and yellower in the radiate circumference.

SYN :—Schær. En. 46. (1850.) Nyl. Syn. 392.
FIG :—E. Bot. t. 1375.
EXS :—M. and N. 1234. Schær. 548. Leight. 143. Mudd 74.
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—7, 8...10...12...15...19, 20...26.
ENGLAND :—Ingleby Moor! Battersby Moor! and Hobhole, Cleveland. *Mr. Mudd*. near Thirsk. *Mr. J. G. Baker*. near Stavely. *Mr. Martindale*. Charnwood Forest, Leicestershire. *Rev. A. Bloxam*. Grassmere, Westmoreland. *Rev. J. Harriman*.
SCOTLAND :—Near Aberdeen. *Prof. Dickie*. near Dunkeld. *Dr. Holl*. Glen Dee in Braemar. *Rev. J. M. Crombie*.
IRELAND :—Kerry. *Messrs. Taylor and Moore*. near Dunkerron. *Dr. Taylor*. Curraghmore, Waterford. *Adm. Jones*. near Lough Inagh, Connemara. *Mr. Larbalestier*.
WALES :—Wall between Bodowen and Glan Mawddach in lane above turnpike road near Barmouth. *Rev. T. Salwey*. Bettws-y-coed! Holyhead!

18. *P. sinuosa*, (Sm.) *flavescent*, *divaricato-lobate*, laciniæ narrow, *sinuato-pinnatifid*, *sinuses circular*, apices dilated, cloven, often sorediate, under surface nigro-fibrillose; apothecia fuscous, margin entire; spores 8, colourless, elliptico-oblong, simple; medulla white K yellow then red.

On rocks, walls, &c. 1784.

SYN :—Sm. E. Bot. 2050. (1809.) Ach. Syn. 207. Nyl. Syn. 384.
FIG :—E. Bot. 2050.
GEOG. DISTRIB :—Throughout the world.
BOT. PROV :—1...7...13...15, 16...19, 20...31.
ENGLAND :—Bournemouth, Devon. *Rev. A. Bloxam*. Rossthwaite, Borrowdale. Cumberland! *Mr. Robertson*.
SCOTLAND :—Dumfriesshire. *Mr. Burgess*. (1784). Ballacheulish; *Messrs. Turner and Hooker*. Badick Castle, Arran! *Sir W. J. Hooker*. Glen Nevis! *Mr. Borrer*. Glencroe! *Dr. Macmillan*.
IRELAND :—Near Kildorrery. co. Cork! *Mr. Carroll*. Dunkerron! *Dr. Taylor*. Killarney! *Sir T. Gage*. Glencar. *Mr. J. Taylor*. Dawros River! Lough Muck! co. Galway. *Mr. Larbalestier*.
WALES :—Barmouth! *Rev. T. Salwey*. Ty Gwyn, near Dolgelley. *Dr. Holl*.
CHANNEL ISLANDS :—Common in Jersey and Guernsey. *Mr. Larbalestier*.
"Spores .014—17 mm. long. .008—9 mm. broad." (*Nyl.*)

19. *P. acetabulum*, (Neck.) *glauco-olivaceous or lurido-olivaceous*, *coriaceo-membranaceous*, sub-opake, orbicular, unequal or *rugulose*, lobate, *lobes rounded*, *flexuose or imbricate*, under surface castaneo-fuscous or nigricant; apothecia badio-rufous, *receptacle corrugate*, margin *rugoso-crenulate and sorediate*; spores 8, colourless, oblong, simple; medulla white K yellow then red.

On trees. 1799.

SYN.—Neck. Delic. Gallobelg. 506. (1768.) Ach. Syn. 199. Nyl. Syn. 395. Mudd Man. 99.

FIG:—E. Bot. 1652. Hepp Sporen t. 98 f. 865.

EXS:—M. and N. 256. Schær 547. Zw. 55. Hepp 865. Anzi It. S. 112. Leight. 362. Mass. 25.

GEOG. DISTRIB:—Europe, Africa, N. America.

BOT. PROV:—2, 3, 4, 5...8...10.

ENGLAND:—Saham Wood, Norfolk. *Sir J. E. Smith.* (1799.) Ickworth Park near Bury. *Rev. G. R. Leathes.* Skutterskelf, Cleveland! *Mr. Mudd.* near Bilston, Staffordshire; Beeding Priory, Sussex! *Rev. A. Bloxam.* Stanstead Park, Essex. *Mr. R. Jacob.* near Ripon, Yorkshire. *Mr. W. Brunton.* Bramber Castle, Sussex. *Mr. Larbalestier.* Felix Hall Park! Kelvedon; Rivenhall; Lyston, Essex. *Mr. Varenne.* near Worcester. *Dr. Holl.* Chilston Park, near Lenham. Broome Park, near Sibertswold, Kent. *Mr. Holmes.* Harborough Magna, near Rugby! *Rev. A. Bloxam.* near Fairford. *Mr. W. Joshua.*

"Spores .00275 to .003 in. long, by .001 to .0015 broad." (*Mudd.*) "Spores .012—16 mm. long, .008—.010 mm. broad." (*Nyl. & T. M. Fr.*)

20. *P. saxatilis*, (L.) cinerascent or albido-cinerascent, membranaceous, orbiculari-expanded, laciniose, *reticulato-rugulose, isidioso-scabrous*, laciniæ sinuato-multifid or sinuato-incised or lobate, apices retuse, black and fibrillose beneath; apothecia spadiceo-badious, or fuscous, margin entire, or crenulate; spores 8, colourless, elliptical, simple; medulla K yellow then red.

On rocks, trees, &c. common. 1724.

All forms of saxatilis are readily distinguished by the reticulato-rugulose thallus.

SYN:—Linn. Fl. Suec. 1075. (1753.) Ach. Syn. 203. Nyl. Syn. 388. Mudd Man. 94.

FIG:—E. Bot. 603. Dill. t. 24. f. 83. Hepp Sporen t. 98. f. 860.

EXS:—Anzi It. S. 104 a. Leight. 203. right spec. Fellm. 78. Hepp 860. pt. Schær. 362. Mudd 66

GEOG. DISTRIB:—Europe, Asia, Africa, N. America.

BOT. PROV:—1...3, 4. 5, 6, 7..10, 11...13, 14, 15, 16...18, 19...31.

ENGLAND:—Ingleby Park, Cleveland. *Mr. Mudd.* Berwick-on-Tweed. *Dr. G. Johnston.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Dunsford, Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Shotover Hill, Oxford. *Mr. Baxter.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Bedford. *Rev. C. Abbot.*

SCOTLAND:—Stennis, Orkney; Ayrshire! *Dr. Lindsay.* Braid Hermitage and Pentland Hills. *Dr. Greville.* Forfarshire. *Mr. W. Gardiner.* Long Island; Arran. *Prof. Balfour.* Glencroe! *Dr. Macmillan.* Isle of May, Firth of Forth. *Mr. Sadler.*

IRELAND:—Killarney. *Dr. Carrington.* trees and rocks, common. *Mr. Carroll.*

WALES:—Aber. *Rev. Hugh Davies.* Cwm Cywion! (fruit) Bwlch mountain near Aberystwith. *Miss Atwood.* Capel Arthog! (corticole in fruit) Snowdon! Aran Mowddwy!

CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey*, common on all the Islands, *Mr. Larbalestier.*

"Spores .0035 in. long, by .002 to .00225 in. broad." (*Mudd.*) "Spores .015—19 mm. long, .009—12 mm. broad." (*Nyl.*) "Spores .014—19 mm. long, .009—12 mm. broad." (*T. M. Fr.*)

f. *glomulifera*, Cromb. thallus bearing *blackish glomerules*, similar to those of *Ricasolia amplissima*.

On alpine boulders. 1872.

SYN:—Crombie in Journ. Bot. n. s. 1. p. 307.

SCOTLAND:—Morrone, Braemar, *Rev. J. M. Crombie.* (1872.)

Var. *sulcata*, Tayl. whitish or albido-glaucescent, *reticulato-sorediate, soredia whitish, margined by the ruptured thallus, sulciform, never isidiiferous;* medulla K yellow then red.

On trees and walls. 1836.

SYN :—Tayl. in Mack. Fl. Hib. 145. (1836.) Nyl. Syn. 389.
FIG :—Mich. Ord. 22. t. 49. C.D.
EXS :—Anzi It. S. 104. b. Leight. 203. left hand spec.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...10, 11.. 15...19—31.
ENGLAND :—Ayton Moor, Cleveland. *Mr. Mudd.* Oswestry and Moor Park near Ludlow! *Rev. T. Salwey.* near Thirsk! *Mr. J. G. Baker.* Kemble near Cirencester. *Mr. W. Joshua.* Swinnop East Allendale, Northumberland. *Rev. W. Johnson.* Walls of the Cemetery! Shrewsbury! Lyth Hill, Shropshire!
SCOTLAND :—Top of Ben Lawers. *Dr. Lindsay.*
IRELAND :—Co. Kerry. *Dr. Taylor.* (1836).
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

forma *hirsuta*, Cromb. *densely black*, rhizineo-*fibrillose beneath.*
On old firs.

SYN :—Crombie in Journ. Bot. May, 1875.
SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie.*

Var. *furfuracea*, (Schær.) thallus *densely isidiose;* medulla K yellow then red.
On rocks, stones and trees.

SYN :—*P. horrescens*, Tayl. belongs to this form. Schær. Enum. 45. Mudd Man. 95.
EXS :—Leight. 46. Schær. 363. Hepp 862. 863. M. & N. 349. Bohl. 11. Fellm. 77. Breut. 116.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...3...5 ..7...10, 11...12...15...19...26.
ENGLAND :—Oswestry! *Rev. T. Salwey.* Yorkshire! *Mr. G. Dixon.* Dartmoor and neighbouring Tors. *Messrs Jones & Kingston.* Ardingley rocks, Sussex. *Mr. W. Joshua.* Foreshield, Alston, Cumberland; Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Wrekin Hill! Nesscliffe Hill! Haughmond Hill! Shropshire.
SCOTLAND :—Birnam Hill, Dunkeld. *Dr. Lindsay.*
IRELAND :—Near Kildorrery, co. Cork! *Mr. Carroll.* Dawros Bridge! co. Galway. *Mr. Larbalestier.*
WALES :—Sychnant near Conway! Barmouth! *Rev. T. Salwey.* Gwydir Woods! Bettws-y-coed.

Var. *omphalodes*, (L.) *fuscous or nigricant, shining*, smoother, reticulato-rugulose; medulla K yellow then red.
On alpine rocks. 1724.

SYN :—Linn. Sp. Pl. ed. 1. (1753.) Ach. Syn. 203. Nyl. Syn. 388. Mudd Man. 95.
FIG :—E. Bot. 604.
EXS :—Schær. 488. Zw. 182. Maudon 29. Leight. 7. Bohl. 18. M. & N. 348. Mudd 67. Larbal. 19. Smrft. 150.
GEOG. DISTRIB :—Europe, Asia.
BOT. PROV :—1...5...7, 8...10...12...15, 16...18...22...31.
ENGLAND :—Cromford Moor near Matlock, Derbyshire. *Sir J. E. Smith.* Cumberland! *Mrs. Stanger.* near Torquay. *Dr. Deakin.* Howden Gill. Cleveland! Kildale Moor! *Mr Mudd.* Craigforda near Oswestry! *Rev. T. Salwey.* Berwick-on-Tweed! *Dr. G. Johnston.* Hornby and Helmsley, Yorkshire. *Mr. Teesdale.* near Penzance and Redruth. *Messrs. Turner and Sowerby.* Northumberland and Durham. *Mr. Winch.* Tors of Dartmoor. *Mr. Parfitt.* Malvern Hills. *Rev. W. S. Rufford.* Moreton; North Bovey and Ilsington, Devon. *Messrs. Jones and Kingston.* Stiperstones Hill! Shropshire.
SCOTLAND :—Amulree, Perthshire! Clova, Forfarshire! Garrynahine, Lewis! *Dr. Lindsay.* Pentland Hills. *Dr. Greville.* Sidlaw Hills and Clova Mountains. *Mr. W. Gardiner.* Long Island. *Prof. Balfour.*
IRELAND :—Lough Bray, co. Wicklow. *Dr. Taylor.*
WALES :—Aber. *Rev. Hugh Davies.* near Aberdovey! *Rev. A. Bloxam.* Conway Mountain! Barmouth! Aran Mowddwy! Cwm Idwal! (fine fruit) Bettws-y-coed!
CHANNEL ISLANDS :—Beauport Bay, Jersey, and all the other Islands. *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

Var. *panniformis*, Ach. cinerascent, *narrowly laciniato-dissected, imbricato-crustaceous;* medulla K yellow then red.

On rocks.

SYN :—Ach. Meth. 204. (1803.) Syn. 203. Nyl. Syn. 388.
FIG :—Westr. Farg. t. 7. f. 6.
EXS :—Schær. 364. Anzi Langob. 294. Hepp 861. 864. Korb. 243. M. & N. 738. Arn. 339.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...(13...18.)
ENGLAND :—Stiperstones Hill, Shropshire!
SCOTLAND :—Grampians plentiful, rarely fertile. *Rev. J. M. Crombie.*
WALES :—Llyn Geirionydd! Trefriw!

f. *subconcentrica*, Cromb. sphærico-conglomerate.

On alpine boulders. 1872.

SYN :—Crombie in Journ. Bot. n. s. 1. 306.
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.* (1872.)

E. *medulla K—C red.* (C alone—).

21. *P. lævigata*, (Sm.) albo-glaucescent or whitish, narrowly laciniato-lobate, *laciniæ divaricate, sinuato-multifid or sinuato-incised*, often subimbricate and tuberculato-sorediate at the apices, laxly affixed, under surface black and atro-fibrilloso-rhizinose; apothecia badio-rufous or fuscescent, margin entire or obsoletely crenate or sorediate; spores 6—8, colourless, elliptical, simple; medulla white K—C red.

On rocks, walls, and trees. 1808.

SYN :—Sm. E. Bot. 1852. (1808.) Ach. Syn. 212. Nyl. Syn. 384. Mudd Man. 95.
FIG :—E. Bot. 1852. Hepp Sporen t. 67. f. 581.
EXS :—Mudd 68. Hepp 581. Leight. 202.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...6, 7...15...17...19, 20...26...31.
ENGLAND :—Lynton, N. Devon! *Miss Attwood.* Two Bridges, Dartmoor! above the Plym by the Dewer Stone, Dartmoor! St. Leonard's Forest! Eridge Rocks! *Mr. Borrer.* Bolt Head, S. Devon! *Dr. Holl.* Bournemouth! *Rev. A. Bloxam.*
SCOTLAND :—Ballachoulish! Rossshire! *Mr. Borrer.* Glencroe! *Dr. Macmillan.*
IRELAND :—Southern Counties! *Miss Hutchins.* Dunkerron! Askew Wood, co. Kerry! *Dr. Taylor.* Tully! co. Galway. *Mr. Larbalestier.* near Ballinahinch, Cleghan!
WALES :—Anglesea and Carnarvonshire! *Rev. H. Davies.* (1808.) Mountains above Barmouth! *Mr. Borrer.* Dolgelley! near Llanberis! *Dr. Holl.* near Aberdovey. *Rev. A. Bloxam.* Pen-y-rhiw! near Fishguard, Pembrokeshire, Moel-y-gest! near Tremadoc. Drwsynant! Gwydir Woods! Bettws-y-coed.
CHANNEL ISLANDS :—N.E. coast Jersey! *Mr. Larbalestier.* Guernsey, *Rev. T. Salwey.*
"Spores .0025 to .003 in long. by .001 in. broad." *(Mudd.)* "Spores .017—23 mm. long, .010—14 mm. broad." *(Nyl.)*

Var. *rugosa*, Tayl. *white*, very uneven, lobes broadly linear, imbricated, margins sinuato-crenate, *rugose at the base on upper surface*, sometimes sorediate, *margin of apothecia rugose;* medulla white K—C red.

On rocks, rare. 1836.

SYN :—Tayl. in. Mack. Fl. Hib. 2. 145. (1836.)
EXS :—Leight. 357. in part. Zw. 181.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...7...15. .19...31.
ENGLAND :— Lizard! Cornwall. *Mr. Curnow.*

SCOTLAND :—Ballacheulish ! *Mr. Borrer.*
IRELAND :—Dunkerron ! *Dr. Taylor.*
WALES :—Dolbadarn, Caernarvonshire ! road-side between Tyn-y-groes and Dol-y-mellyn Bridge, Merionethshire ! *Mr. Borrer.* Ty Gwyn near Dolgelley ! *Rev. T. Salwey.* Aberdovey ! Dolgelley !
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

Var. *revoluta*, (Flk.) sinuato-lobate, *lobes cucullato-revolute and tuberculoso-sorediate* at the apices and often at the margins ; medulla white K—C red.

On trees.

SYN :—Flk. Deut. Lich. 15 (1815) Nyl. Syn. 385. (excl. syn.)
EXS :—Schær. 612. Leight. 357. Nyl. 112. Mudd 69. Zw. 181. bis B. Larb. 64. Rabh. 860. Anzi Langob. 256. Mass. 325.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...5...7...15...19...26...31.
ENGLAND :—Penzance ! *Rev. H. Penneck.* St. Leonard's Forest ! *Mr. Borrer.* Oswestry ! and Ludlow, Shropshire ! *Rev. T. Salwey.*
SCOTLAND :—Glencroe ! *Dr. Macmillan.*
IRELAND :—Blackwater Bridge, Kerry. *Dr. Taylor.* Kerry. *Dr. Moore.* near Letterfrack ! *Mr. Larbalestier.*
WALES :—Tygwyn near Dolgelley ! *Rev. T. Salwey.* Aberdovey. *Rev. A. Bloxam.* Moel-y-gest !
CHANNEL ISLANDS :—Rozel ! Gorey, Jersey ! *Mr. Larbalestier.*
"Spores .011–14 mm. long, .007–8 mm. broad." (*Nyl.*)

Var. *subsinuosa*, (Leight.) *laciniæ narrow, sinuato-pinnatifid, apices attenuate*, sub-truncate, *cloven, under surface atro-fibrillose ;* medulla white K—C red.

On trees and rocks. 1871.

EXS :—Schær. 561. Spruce 132. 176. Arn. 137.
BOT. PROV :—7...26.
IRELAND :—Near Ballinahinch ! *Mr. Larbalestier.*
WALES :—Cwm Cwyion ! (1871).

22. *P. Delisei*, (Dub.) Nyl. *pale olive*, lobes interwoven, elevated, narrow ; *medulla K—C reddish.*

On rocks. 1872.

SYN :—*P. olivacea, var. Delisei*, Dub. Bot. Gall. 602. (1829). *P. prolixa var. Delisei*, Nyl. Scand. 102. Flora 1872 p. 426. Crombie in Journ. Bot. n. s. 2. 133.
EXS :—Nyl. Pyr. Or. 1. 54.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1.
ENGLAND :—Kynnal Cliff, near Penzance. In this locality isidiiferous and panniform conditions also occur. *Mr. Curnow.*

23. *P. incurva*, (Pers.) ochroleucous or flavido-cinerascent, sub-opake, orbicular, stellato-laciniose, appressed, *laciniæ narrow, multifid, somewhat convex, crowded, apices incurved* and imbricate, *soredia albo-flavescent, verrucoso- tuberculose*, under surface concolorous, rhizinæ nigricant ; apothecia spadiceo-fuscous or dark rufescent, small, margin sub-entire ; medulla K—C faint red.

On rocks, rare. 1793.

SYN :—Pers. in Ust. Ann. 7. p. 24. (1794). Nyl. Syn. 394.
FIG :—Dicks. Cr. Br. t. 9. f. 7.
EXS :—Tuck. 76. Fr. 259. Reich. and Schub. 88. Stenh. 123.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—8...11...15...19...23...30.
ENGLAND :—Beamish Moor and Eglestone Fell, Durham ; Hedgehope and Cheviot, Northumberland. *Mr. Winch.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.*

SCOTLAND :—Braemar; Grampians. *Rev. J. M. Crombie.*
IRELAND :—Dunkerron co. Kerry. *Dr. Taylor.* Howth; Killarney; and Knockligpil, co. Antrim. *Dr. Moore.*
"Spores .009—.013 mm. long, .005—.6 mm. broad." (*Nyl.*) "Spores .008—.12 mm. long, .005—.6 mm. broad." (*T. M. Fr.*)

24. *P. xanthomela*, (Nyl.) similar to *P. lævigata*, but medulla yellow, K—C red.

On rocks. 1876.

SYN :—Nyl. in Flora 1874 p. 308.
IRELAND :—Road to Rosses near Kylemore. *Mr. Larbalestier.* (1876).

E. *medulla of thallus yellow, K yellowish-brown.*

25. *P. endochlora*, (Leight.) like *lævigata*, whitish, *very uneven, laciniæ sinuato-lobatæ, retusæ, tuberculoso-suprioumti-aureolatæ; medulla yellow, K yellowish-brown;* apothecia rufous-brown, receptacle *verrucosæ*, reticulato-lacunose, margin *verrucosæ incurved*; spores as in *lævigata*.

On rocks.

GEOG. DISTRIB :—Europe.
BOT. PROV :—15...19.
IRELAND :—Dunkerron ! ; Askew Wood, co. Kerry. *Dr. Taylor.* Glencroe ! *Dr. Macmillan.*
Much resembling *P. tiliaceus* var. *rugosa*, Tayl. It may be *P. aurulenta*, Tuck. Suppl. 1. 424 but I have seen no authentic specimen.

## SUB-TRIBE. III. PHYSCIEI.

Thallus laciniate, variously divided, generally stellato-orbicular. Apothecia orange or yellow or nigricant, lecanorine. Paraphyses distinct. Spores colourless or fuscous, bilocular or 1-septate. Sterigmata pluri-articulate. Spermatia oblongo-cylindrical, incrassate at the apices.

## V. PHYSCIA, *Nyl.*

Characters as above.

A. *Thallus flavescent (K purple.)*

1. *P. flavicans*, (Sw.) *yellow or orange-yellow, cæspitose*, subterete, slender, *entangled*, much branched, branches attenuate, *furcellate at the apices;* apothecia orange or rufous, margin thin, sub-entire; spores 8, colourless, elliptico-oblong, polari-bilocular.

On trees, rocks, &c. 1724.

SYN :—Swartz Prodr. Fl. Ind. 147. (1788.) Ach. Syn. 224. Nyl. Syn. 406.
FIG :—E. Bot. 2113. Hepp Sporen t. 65. f. 570.
EXS :—Hepp 570. Schær. 552. Welw. Lusit. 11. Spruce Amaz. 171. Larb. 21. Mudd 84. Leight. 169. Mass. 17. Reich. & Schub. 39.
GEOG. DISTRIB :—W. Europe, Asia, Africa, America, Australasia.
BOT. PROV :—1, 2, 6, 7...10...18, 19, 20...31.
ENGLAND :—Near Lewes, Sussex ! *Mr. Borrer.* Devonshire. *Sir J. E. Smith.* Penzance. *Rev. T. Salwey.* Lands End, Cornwall. Waldershare Park, Kent. *Mr. Holmes.* near Hastings; Isle of Wight; S. Devon and Cornwall generally; South Brent, Devonshire. *Dr. Holl.* Dunsford; Budleigh Salterton, Devon. *Mr. Parfitt.* Brockenhurst, New Forest. *Rev. J. M. Crombie.* Trengwainton ! near Penzance. *Mr. Curnow.* on the Lanyon Coit. *Rev. J. P. Jones.* Dartmoor; Bottor rocks; Inwardleigh; Lustleigh Cleve, Devon. *Messrs. Jones and Kingston.*

SCOTLAND :—Craig of Ailsa. *Rev. J. Lightfoot.*

IRELAND :—Ardglass. *Dr. Mainguy.* near Waterford. *Dr. Barker.* Dublin Mountains and Killiney Hill. *Dr Taylor.* Lambay Island near Dublin; Ardmore, Waterford, Castlemartyr, Lisquinlan, Castlebernard, and Cape Clear Island, co. Cork; Western Blasquet Island, Kerry. *Mr. Carroll.* Kinsale. *Mr. J. Cooke.*

WALES :—Moel-y-Golfa near Welshpool, and Picton, Pembrokeshire. *Rev. T. Salwey.* Aberdovey. *Rev. A. Bloxam.* Angle, Pembrokeshire. *Mr. Lees.* Rocks N. of Barmouth!

CHANNEL ISLANDS :—Rozel; L'Etacq; St. Lawrence! La Moye, Jersey! Island of Sark! Jerbourg, Guernsey; Brechou. *Mr. Larbalestier.*

"Spores .0025 in. long, by .001 to .00125 broad. t. 2. f. 33." *(Mudd.)* "Spores .012—18 mm. long, .007—.011 mm. broad." *(Nyl.)*

2. *P. chrysophthalma*, (L.) *yellow or flavo-albicant* or flavo-cinerascent, *rigescent*, narrowly laciniate, laciniæ ascending, divaricato-multifid, *apices fibrilloso-ramulose or spinose, whitish beneath;* apothecia orange, margin fibrilloso-ciliate, sometimes naked; spores 8, colourless, elliptico-oblong, polari-bilocular.

On trees. 1801.

SYN :—Linn. Mant. 2. 311. (1771.) Ach. Syn. 224. Nyl. Syn. 410.

FIG :—E. Bot. 1088. Hffm. Pl. L. t. 36. f. 1. and t. 31, f. 1. Hepp Sporen t. 65. f. 569.

EXS :—Hepp 569. M. & N. 254. Mass. 55. 56. Larb. 22. Welw. Lusit. 64. 69. Schær. 389. Bohl. 322. Leight. 394. Nyl. Pyr. or. 2.

GEOG. DISTRIB :—Europe, Africa, America, Polynesia, Australasia.

BOT. PROV :—16...19. 20...30, 31,

ENGLAND :—Devonshire. *Mr. Sowerby.* (1801.) Lancing! and Brighton! Sussex. *Mr. Borrer.* near Lewes, Sussex. *Mr. Unwin.* near Torquay. *Sir W. J. Hooker.*

SCOTLAND :—Ben Brecht, Argyleshire. *Mr. Paterson.*

IRELAND :—Balluirea, Carrigalim; near Cork; near Newcastle, co. Down. *Mr. Carroll.* Cave Hill, near Belfast. *Prof. Dickie.* Killrittain. *Mr. Alexander.* Vernonmount and Blarney, Cork, and Castlebernard Park, Bandon. *Mr. J. Sullivan.* Berborough, Cork. *Mr. Cooke.* Muckrone! *Mr. Hardy.*

CHANNEL ISLANDS :—Guernsey; St. Brelade's, Jersey! and Sark! *Mr. Larbalestier.* orchard at Sark. *Rev. T. Salwey.*

The forma *Dickieana* (Linds. Mem. Sperm. 254.) seems only a paler coloured state with entire margin to the apothecia. It has occurred at Cave Hill, Belfast, and Newcastle, co. Down. *Dr. Dickie.* and Noirmont, Jersey. *Mr. Larbalestier.*

"Spores .003 to .0035 in. long, by .00125 in. broad. t. 2. f. 34." *(Mudd.)* "Spores .011—17 mm. long, .006—.010 mm. broad." *(Nyl.)*

3. *P. parietina*, (L.) *yellow*, sub-orbicular, membranaceous, *rotundo-lobato-incised*, lobes sub-imbricate, appressed, plane or sub-concave, *smooth*, margins crenate, thickened and upturned, under surface paler or whitish; apothecia concolorous or waxy-orange-coloured, margin *entire;* spores 8, colourless, oblong, polari-bilocular.

On trees, pales, rocks, &c. common. 1690.

SYN :—Linn. Sp. Pl. ed. 1. No. 25. (1753.) Ach. Syn. 290. Nyl. Syn. 410. Mudd Man. 113.

FIG :—E. Bot. 194. Tul. Mem. t. 1. f. 1—7. Hepp Sporen t. 99. f. 870.

EXS :—Schær. 380. Mass. 31. 32. Welw. Lusit. 82. Bohl. 12. M. and N. 66. Maudon 34. Anzi It. S. 130. Mudd 85. Leight. 10. Hepp 870. Larbal. 67.

GEOG. DISTRIB :—Europe, Asia, Africa, N. America.

BOT. PROV :—1...3, 4, 5, 6, 7, 8...10, 11...15, 16.. 18. (19—30.) 26...31.

ENGLAND :—Charnwood Forest! Leicestershire. *Rev. A. Bloxam.* Yorkshire! *Mr. Dixon.* Ayton! Cleveland. *Mr. Mudd.* Northumberland and Durham. *Mr. Winch.* Baggypoint, N. Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Cambridge. *Rev. R. Relhan.* Swinnop, East Allendale, Northumberland; Alston, Cumberland. *Rev. W. Johnson.* Market Rasen! Lincolnshire. *Dr. F. A. Lees.* Shropshire!

SCOTLAND :—Long Island; Arran. *Prof. Balfour.* Forfarshire. *Mr. Gardiner.* Hebrides and Orkneys. *Dr. Lindsay.* Isle of May, Firth of Forth. *Mr. Sadler.*

IRELAND:—On trees, rocks, &c., common. *Mr. Carroll.* River Dawros, co. Galway. *Mr. Larbalestier.*

WALES:—Aberayron, Cardiganshire. *Miss Attwood.* Y Fegle fawr, near Barmouth! St. David's! Mumbles! Pembrokeshire. Drwsynant!

CHANNEL ISLANDS;—Jersey! Sark. Herm. Jethou. Crévichou. *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

"Spores .0025 in. long, by .001 to .00125 in. broad." *(Mudd.)* "Spores .010—16 mm. long, .007—9 mm. broad." *(Nyl.)* "Spores .012—16 mm. long, .007—9 mm. broad." *(T. M. Fr.)*

Var. *aureola*, (Ach.) *more intense yellow or orange, rotundo-lobate, sinuato-incised*, crenate, thickened and upturned at the margins, under a lens *very minutely granulate* on the surface, margin of apothecia *crenulate.*

On rocks and stones.

SYN:—Ach. L. U. 487. (1810.) Syn. 210. Nyl. Syn. 411. Mudd Man. 113.
EXS:—Mass. 34. Rabh. 773. Arn. 65. Nyl. Pyr. or. 55.
GEOG. DISTRIB;—Europe.
BOT. PROV:—1...5...11...15.
ENGLAND:—Exeter. *Mr. Parfitt.* East Allendale, Northumberland. *Rev. W. Johnson.* Llanymynech Hill! Shropshire.
SCOTLAND:—Kincardineshire. *Rev. J. M. Crombie.*

Var. *ectanea*, (Ach.) *yellowish-orange, multifido-laciniate*, laciniæ *narrow*, imbricated, *sub-convex, sub-lacunose*, thickened at the margins, *slightly granulated* on the surface; margin of apothecia *crenulate.*

On rocks.

SYN:—Ach. L. U. 464. (1810.) *rutilans*, Syn. 210. Nyl. Syn. 411. Mudd Man. 113.
EXS:—Anzi Ven. 167. Zw. 57. Welw. Lusit. 72.
GEOG DISTRIB:—Europe, Africa, N. America, Chili, Australasia.
BOT. PROV:—6, 7.
ENGLAND:—Crumbles, Eastbourne. *Mr. Roper.*
WALES:—Tenby! *Mr. Lees.* Borth! Y Fegle fawr! near Barmouth. Manorbeer! Holyhead!

Var. *laciniosa*, (Duf.) orange-coloured, stenophyllous, *lacero-or pinnatifido-dissected*, stellato-appressed, more or less ascending.

On trees, rocks, &c.

SYN:—Fr. L. E. Ref. 73. Mudd Man. 113.
FIG:—E. Bot. 1794. Hepp Sporen t. 72. f. 633.
EXS:—Schær. 381. Anzi Langob. 296. 255. (left sp.) Mass. 36. Hepp 872. 633. Leight. 11.
GEOG. DISTRIB:—Europe.
BOT. PROV:—3...5...11...14.
ENGLAND:—Yeldham, Essex. *Mr. Varenne.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* near Shrewsbury!
SCOTLAND:—Blackford Hill, near Edinburgh. *Sir J. E. Smith.*

Var. *lychnea*, (Ach.) *orange-coloured, pulvinate, crowded, rotundo-squamulose, ascendenti-imbricate*, margins *granuloso-pulverulent* or lacero-dissected; margin of apothecia entire, pulverulent.

On trees and old railings.

SYN:—Ach. Meth. 187. (1803.) Syn. 210. Nyl. Syn. 411. Mudd Man. 114.
FIG:—Hepp Sporen t. 99. f. 871.
EXS:—Schær. 382. 549. Anzi Langob. 58. Hepp 871. 872. 873. Fellm. 86. Rabh. 885.
GEOG. DISTRIB:—Europe.
BOT. PROV.:—1...3...5...7...15...19...29...30.
ENGLAND:—Shropshire! *Rev. T. Salwey.* Hay Tor, Dartmoor! Malvern Hills. *Dr. Holl*, Wheatfield Park! Oxfordshire. *Mr. Larbalestier.*

SCOTLAND :—Ben Lawers. *Dr. Holl.* Braemar and Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—North of Ireland; and Castlebernard Park, Bandon. *Adm. Jones.*
WALES :—Llyn Geirionydd! Criccieth Castle!

Var. *polycarpa*, (Ehrh.) greenish-yellow, *granulato-conglomerate, margins granulato-crenate; apothecia numerous, crowded*, margin *turgid, entire.*

On trees, palings, and rocks. 1807.

SYN :—Ehrhart Crypt. 136. (1785.) Ach. Syn. 192. Nyl. 411. Mudd Man. 113.
FIG :—E. Bot. 1795. Hepp Sporen t. 7. f. 54.
EXS :—Hepp 54. 595. Mass. 35. Mudd 86. Anzi Langob. 295. Leight. 265. Arn. 497.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—1...3, 4, 5...10, 11...15.
ENGLAND :—Near Yarmouth. *Mr. Turner.* (1807.) Stokesley! Redcar! Cleveland. *Mr. Mudd.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Budleigh Salterton, Devon. *Dr. Dickie.* Midland Counties; Christ Church Meadow, Oxford. *Mr. Purton.* Bradley Green, Worcestershire. *Rev. W. S. Rufford.* Stiperstones! Long Mynd! near Shrewsbury! Shropshire.
SCOTLAND :—Durris, Kincardineshire. *Rev. J. M. Crombie.*

Forma *tumida*, (Wedd.) *verrucoso-bullate.*

On walls, rocks and trees. 1871.

SYN :—Weddell Lich. Prom. in Bull. Soc. Bot. France 198. (1869.)
GEOG. DISTRIB :—France.
BOT. PROV :—3...5.
ENGLAND :—Tetsworth! Oxfordshire. *Mr. Larbalestier.* Llanymynech Hill! Shropshire. (1871.)

Forma *cinerascens*, Leight. thallus and margins of apothecia *cinereo-albicant.*

On elms and palings. 1878.

BOT. PROV :—3.
ENGLAND :—Wheatfield Park! Oxford. *Mr. Larbalestier.* (1878.)

B. *Thallus cinerascent.*

§ *medulla* K—C—.

4. *P. intricata*, (Desf.) cinereous or cinerascent, *cæspitose, narrowly tereti-compressed*, laciniate, *densely puberulo-villose*, laciniæ divaricato-ramose, entangled, obsoletely canaliculate beneath; apothecia lateral, sessile, fuscous-black, plane, margin entire downy; spores 8, colourless, elliptico-oblong, 1-septate.

On trees and rocks, rare. 1804.

SYN :—Desfontaines Fl. Atlant. 2. 419. (1800.) *atlantica*, Nyl. Syn. 408. Ach. Syn. 223. Mudd Man. 104.
FIG :—E. Bot. 1715. Nyl. Syn. t. 8. f. 50.
EXS :—Mudd 76. Bourgeau 610. Welw. Lusit. 14.
GEOG. DISTRIB :—W. Europe, Africa.
BOT. PROV :—1. 2.
ENGLAND :—Cliffs near Hastings, Sussex! Bracklesham in Selsey Island; *Mr. Borrer.* (1804.) Bolt Head, Devon. *Rev. J. M. Crombie.*
"Spores .0045 to .005 in. long, by .0025 to .003 in. broad." *(Mudd.)* "Spores .018—26 mm. long, .011—15 mm. broad." *(Nyl.)*

5. *P. ciliaris*, (L.) *albido-cinerascent or cinerascenti-fuscescent, lineari-laciniate*, laciniæ sub-ascending, multifid, imbricato-intricate, *tomentose, canaliculate*, whitish beneath, *margins fibrilloso-ciliate;*

*apothecia pedicellate*, fuscous-black, cæsio-pruinose, rarely naked, margin sub-entire, inflexed; spores 8, fuscous, oblong, 1-septate; (medulla K—C—).

On trees and rocks. 1785.

SYN :—Linn. Sp. Pl. ed. 1. No. 28. (1753.) Ach. Syn. 220. Nyl. Syn. 414. Mudd Man. 105.
FIG :—Hffm. Pl. L. t. 3. f. 4. Hepp Sporen t. 19. f. 168.
EXS :—Hepp 168. Schær. 388. M. & N. 64. Larbal. 68. Reich. and Schub. 38. Leight. 364.
GEOG. DISTRIB ;—Europe, Africa, N. America.
BOT PROV :—1. 2, 3, 4, 5...8...14, 15...21...31.
ENGLAND ;—Leicestershire! *Rev. A. Bloxam.* Kelvedon, Essex. *Mr. Varenne.* common in Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Bedfordshire. *Rev. C. Abbot.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Shropshire! Moor Park! Herefordshire.
SCOTLAND :—Balthayock! Perth. *Dr. Lindsay.* Baldovan; Mains; Auldbar; Foulis. *Mr. Gardiner.* Castle of Melgund; between Forfar and Kirrimuir. *Mr. Croall.* Auchindenny and Rosslyn Woods; Dalkeith; about Kirkliston. *Dr. Greville.*
IRELAND :—Oakpark, near Carlow. *Dr Moore.*
CHANNEL ISLANDS ;—Guernsey. *Rev. T. Salwey.* Jersey and Sark! *Mr. Larbalestier.*
"Spores .007 to .0075 in. long, by .0035 in. broad." (*Mudd.*) "Spores .036—50 mm. long, .018—24 in. broad." (*Nyl.*) "Spores .030—50 mm. long, .018—24 mm. broad." (*T. M. Fr.*)

Forma *actinota*, (Ach.) *margin* of apothecia *proliferous, laciniolæ sub-fimbriate.*

On trees. 1724.

SYN :—Ach. L. U. 497. (1810). Nyl. Lich. Scand. 108.
FIG :—E. Bot. 1352.
EXS :—Rabh. 309. Mudd 77. Mass. 39. Breut. 309.
GEOG DISTRIB :—Europe.
BOT. PROV ;—4...10, 11...15.
ENGLAND :—Bedfordshire. *Rev. C. Abbot.* near Ayton. Cleveland! *Mr. Mudd.* Yorkshire! *Mr. Dixon.* Northumberland and Durham. *Mr. Winch.*
SCOTLAND :—Old Castle of Melgund, Forfarshire. *Dr. Lindsay.*

Forma *verrucosa*, (Ach.) laciniæ broader, *verrucoso-papillate, spermogoniferous.*

On trees.

SYN :—Ach. L. U. 497. (1810.) Nyl. Lich. Scand. 109.
EXS :—Bohl. 38. Anzi Langob. 258. A.
GEOG. DISTRIB ;—Europe.
BOT. PROV ;—3...5...7...10...15.
ENGLAND :—Llanforda near Oswestry! *Rev. T. Salwey.* near Datchet! *Miss Attwood.* near Thirsk! *Mr. Baker.* between South Littleton and Badsey, Worcestershire. *Mr. Purton.*
SCOTLAND :—Balthayock, Perth. *Dr. Lindsay.*

Forma *saxicola*, (Nyl.) *dark-cervine* or fuscescent, appressed, margins and extremities of the narrow laciniæ *with long brownish-black ciliæ.*

On maritime rocks.

SYN ;—Nyl. Syn. 414. Mudd Man. 105.
GEOG. DISTRIB ;—Europe, Canaries.
BOT. PROV :—1...7, 8...10...15...19...31.
ENGLAND :—Near Langbraugh, Cleveland. *Mr. Mudd.* near Buxton. *Dr. Holl.* Devon. *Mr. Parfitt.*
SCOTLAND :—Morrone in Braemar. *Rev. J. M. Crombie.*
IRELAND :—Sybil Head, co. Kerry. *Mr. Carroll.*
WALES ;—Holyhead Mountain!
CHANNEL ISLANDS ;—Quenvais, Jersey. *Mr. Larbalastier.*

6. *P. pulverulenta*, (Schreb.) pallido-cinerascent or pale cinereo-rufescent or pale olivaceo-cervine, opake, *suborbiculato-stellate*, appressed, firm, laciniæ plane, multifid, *minutely albo-granuloso-pruinose towards the obtuse crenato-incised apices*, under surface nigricanti-fibrillose; apothecia fuscous, cæsio-pruinose, margin tumid, entire, pruinose; spores 8, fuscous, oblong, 1-septate; (medulla K— C—).

On trees, common.

SYN :—Schreb. Spicil. 128. (1771.) Ach. Syn. 214. Nyl. Syn. 419. Mudd Man' 110.
FIG :—Hffm. Pl. L. t. 8. f. 2. Hepp Sporen t. 99. f. 874.
EXS :—M. & N. 162. (in part) Anzi It. S. 122. Schær. 356. Hepp 874. (in part).
GEOG. DISTRIB :—Europe, Africa, N. America.
BOT. PROV :—1, 2, 3...5...7...10, 11...14, 15...(19—30.)...31.
ENGLAND :—Northumberland and Durham. *Mr. Winch.* Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr Varenne.* Midland Counties. *Mr. Purton.* Guestling, Sussex; Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Bourton-on the-Water. *Mr. Joshua.* Bovey Tracey; Bagtor Wood, Ilsington, Devon. *Messrs. Jones & Kingston.* near Shrewsbury! and Shropshire! generally. Moor Park! Herefordshire.
SCOTLAND :—Common on trees. *Sir W. J. Hooker.* Forfarshire. *Mr. W. Gardiner.* Braid Hermitage; Blackford House; Swanston Wood near Edinburgh. *Dr. Greville.*
IRELAND :—On trees, common. *Mr. Carroll.*
WALES :—Bettws-y-coed churchyard!
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* common on all the Islands. *Mr. Larbalestier.*
"Spores .006 to .007 in. long, by .003 to .0035 in. broad." (*Mudd.*) "Spores .020—36 mm. long, .012—20 mm. broad." (*Nyl.*) "Spores .020—36 mm. long, .010—12 mm. broad." (*T. M. Fr.*)

f. *pityrea*, (Ach.) thallus thinner, sub-cinerascent, sub-effuse, *laciniæ shortish, sorediate at the margins, margin of apothecia crenulate or sorediato-lacerate*; (medulla K— C—).

On trees and walls. 1783.

SYN :—Ach. Prodr. 123. (1798.) Syn. 201. Nyl. Syn. 420. Mudd Man. 111.
FIG :—E. Bot. 2064.
EXS :—M. & N. 352. (in part) Schær. 487. (in part) Mudd 83. Zw. 186. Arn. 256. Hepp 876. Reich. & Schub. 87.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...3, 4, 5...10...13...15.
ENGLAND :—Strumpshaw; Norfolk and Suffolk. *Sir J. E. Smith.* Bury. *Rev. G. R. Leathes.* Oswestry! Castle Walks! Ludlow! *Rev. T. Salwey.* Cambridge. *Mr. Larbalestier.* Countess Weir, Devon. *Mr. Parfitt.* Pophills, Warwickshire. *Rev. W. S. Rufford.* near Oxford. *Mr. Baxter.* Oversley, Warwickshire. *Mr. Purton.* Thame Park! Tetsworth! Oxfordshire. *Mr. Larbalestier.* Yorkshire. *Mr. Mudd.*
SCOTLAND :—Glasgow. *Dr. Scouler.* Marten's Den, Forfarshire. *Mr. Croall.*
"Spores .024—28 mm. long, .015—18 mm. broad." (*Nyl.*)

f. *angustata*, (Hffm.) smaller, *pallido-cinereo-rufescent, laciniæ narrower*, linear, dichotomous.

On moss. 1861.

SYN :—Hffm. Enum. 77. (1784.) Ach. Syn. 214. Nyl. Syn. 420. Mudd Man. 110.
FIG :—Hffm. Enum. t. 11. f. 2.
EXS :—Anzi Langob. 54.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...10.
ENGLAND :—Yorkshire. *Mr. Mudd.* Bentham, near Cricklade. *Mr. W. Joshua.*

f. *muscigena*, (Whlnb.) darker, *cervino-fuscescent*, generally *albo-cæsio-pruinose*, *laciniæ* shorter, *more distinct*, *ascending*.

On moss. 1861.

SYN :—Whlnb. Fl. Lapp. 422. (1812) Ach. Syn. 212. Nyl. Syn. 420. Mudd Man. 110.
EXS :—Schær. 486. Arn. 64. Anzi Langob. 54. B. Venet. 21. Hepp 875.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*
"Spores .024—30 mm. long, .011—15 mm. broad." (*Nyl.*)

f. *venusta*, (Ach.) *cervine*, epruinose, *margin* of apothecia *crowned with laciniolæ or horizontal thalline lobulæ*.

On trees. 1724.

SYN :—Ach. Meth. 211. (1803.) Syn. 212. Nyl. Syn. 420.
FIG :—Ach. Meth. t. 8. f. 5. E. Bot. 2063.
EXS :—M. & N. 162. (in part) Schær. 356, (in part) Maudon 33 Hepp 874. (in part). Anzi It. S. 123. Bohl. 69. Mudd 82.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...3, 4, 5...7...10...11...15...19.
ENGLAND :—Yorkshire ! *Mr. G. Dixon.* near Ayton ! Cleveland. *Mr. Mudd.* Wrenbury, S. Devon. *Dr. Holl.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* East Allendale and Haydon Bridge, Northumberland. *Rev. W. Johnson.* Haughmond Hill ! Ensdon, near Shrewsbury !
SCOTLAND :—Lochaber. *Rev. J. M. Crombie.*
IRELAND :—Blarney ! and near Cork. *Mr. Carroll.*
WALES :—Bettws-y-coed churchyard !
All the various forms or states of *P. pulverulenta* are readily recognized by the thallus generally or the apices of the laciniæ being clothed with minute albo-granulose pruina and the chemical reaction of medulla K—C—.
"Spores .026—36 mm. long, .012—20 mm. broad." (*Nyl.*)

7. *P. obscura*, (Ehrh.) *olivaceo-virescent or fuscescent*, sub-orbiculari-stellate, *appressed*, laciniæ *narrow*, *inciso-lobate*, *plane*, *smooth*, margins often sorediate, under surface *nigro-fibrilloso-ciliate ;* apothecia nigro-fuscous, naked, *margin pale entire ;* spores 8, fuscous, elliptico-oblong, 1-septate ; spermatia very minute, oblong ; (medulla white K— C—).

On trees, &c. 1808.

SYN :—Ehrhart Crypt. 177. (1785.) Nyl. Syn. 427. *P. cycloselis*, Ach. Syn. 216. Mudd Man. 109.
FIG :—E. Bot. 1942. Hepp Sporen t. 68. f. 596.
EXS :—Nyl. 33. Hepp 597. Schær. 355. Anzi It. S. 125. Mudd 80. Leight. 80. Smrft. 68.
GEOG. DISTRIB :—Europe, Asia, Africa, Australasia.
BOT. PROV:—1, 2, 3, 4, 5...7, 8...10, 11...14 ..16...(19—30.)...31.
ENGLAND :—Lakenham ; Seething, Norfolk ; Gisleham, Suffolk. *Sir J. E. Smith.* (1808.) Sussex. *Mr. Borrer.* Yarmouth. *Mr. Turner.* near Ayton ! and Easby ! Cleveland. *Mr. Mudd.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Gopsall Park, Leicestershire. *Rev. A. Bloxam.* Penzance. *Dr. Holl.* Upton Magna ! and other places near Shrewsbury ; Llanymynech !
SCOTLAND :—Appin Argyleshire. *Capt. Carmichael.* near Colinton. *Dr. Greville.*
IRELAND :—Common on rocks and trees. *Mr. Carroll.*
WALES :—Edderton ! Montgomeryshire.
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* common on all the Islands. *Mr. Larbalestier.*
"Spores .004 to .005 in. long, .00175 in. broad." (*Mudd.*) "Spores .018—25 mm. long, .009—.011 mm. broad." (*Nyl.*) "Spores .015—25 mm. long, .009—12 mm. broad." (*T. M. Fr.*)

Var. *chloantha*, (Ach.) *glaucous-green or cinereous, laciniæ broader and more approximate*, apothecia very numerous.

On trees &c.

SYN :—Ach. Syn. 217. (1814.) Nyl. Lich. Scand. 112. Mudd Man. 110.
EXS :—Schær. 353, 354. Hepp 596. Anzi Langob. 293 Venet. 22. It. S. 124. Mudd 81.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...10.
ENGLAND :—Ayton ! Cleveland. *Mr. Mudd.* Llanforda ! Shropshire.

f. *lithotea*, (Ach.) *glauco-fuscescent*, orbicular, *laciniæ multifid, linear, very narrow*, margins atro-ciliate.

On maritime rocks, rare. 1877.

SYN :—Ach. Meth. 199 (1803).
BOT. PROV :—7.
WALES :—Great Orme's Head ! (1877.)

Var. *virella*, (Ach.) *glauco-virescent or cinereous*, stellate, *laciniæ abbreviated*, laciniato-lobate, obtuse, *sorediate*. K—C—.

On trees, &c. 1807.

SYN :—Ach. Prod. 108. (1798.) Syn. 191. Nyl. Syn. 427. Mudd Man. 110.
FIG :—E. Bot. 1696. (2 upper fig.)
EXS :—Hepp 599. Anzi It. S. 126. Bohl. 104.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3...5, 6...26.
ENGLAND :—Sussex. *Mr. Borrer.* (1807.) near Oxford. *Mr. Baxter.* South of England. *Rev. J. M. Crombie.* Park, Cirencester. *Mr. W. Joshua.* near Shrewsbury ! Worfield ! and Llanymynech ! and on rocks on Haughmond Hill ! and Llanymynech Hill !
IRELAND :—Lord Sligo's Demesne, Westport, co. Mayo. *Mr. Larbalestier.*
WALES :—South Wales. *Dr. Holl.*

Var. *ulothrix*, (Ach.) base of *receptacle* of apothecia *nigro-fibrillose*.

On trees, &c. 1807.

SYN :—Ach. Prod. 113. (1798.) Syn. 217. Nyl. Syn. 428. Mudd Man. 110.
FIG :—E. Bot. 1696. (lower fig).
EXS :—M. & N. 448. Fellm. 88. Anzi It. S. 127.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...5...15...19...26...30, 31.
ENGLAND :—Sussex. *Mr. Borrer.* Shropshire. *Rev. T. Salwey.* Tetsworth ! Oxfordshire. *Mr. Larbalestier.*
SCOTLAND :—Glen Fendor, Blair Athole, *Rev. J. M. Crombie.*
IRELAND :—Near Belfast. *Mr. Templeton.* Dunkerron. *Dr. Taylor.* Road to Recess. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

8. *P. adglutinata*, (Flk.) *olivaceo-virescent, dark*, orbicular, imbricato-stellate, *laciniæ narrow, closely appressed*, multifid, surrounding *the leprose sorediate* centre ; (medulla K—C—.) ; spermatia long acicular.

On trees, walls, &c. 1810.

SYN :—Flk. in Moug. St. Vog. 543. (1818).
FIG :—Hepp Sporen t. 7. f. 55. E. Bot. t. 2158.
EXS :—Reich. & Schub. 84. Nyl. 34. Mass. 246. Anzi Langob. 373. It. S. 129. Hepp 55. Schær. 609. Wright 90. M. & N. 543.
GEOG. DISTRIB :—Europe, Cuba.
BOT. PROV :—1, 2...4...(19...26...30)...31.
ENGLAND :—Norwich. *Sir J. E. Smith.* Sussex ! *Mr. Borrer.* near Exeter. *Rev. J. M. Crombie.*
IRELAND :—On trees frequent. *Mr. Carroll.* Dunkerron. *Dr. Taylor.* Kylemore. *Mr. Larbalestier.*
CHANNEL ISLANDS :—St. Ouen's, Noirmont, Jersey. *Mr. Larbalestier.*

f. *sorediata*, (Nyl.) *albido-glaucescent, closely appressed, laciniæ broader, dilated at the extremities*, margins and centre *sorediate*.

On walls and trees, uncommon. 1875.

IRELAND :—Base of Letter Hill! near Letterfrack, co. Galway. *Mr. Larbalestier.* (1875.)

9. *P. retrogressa*, (Strtn.) like *P. stellaris*, medulla K— and spores somewhat smaller .003—.018 mm. long, .007—.009 mm. broad.

On trees. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 85. (1875.)
SCOTLAND :—Near Altnaharra, co. Sutherland. *Dr. Stirton.* (1875.)

§§ *thallus and medulla* K+C+.

10. *P. leucomela*, (L.) whitish or *albido-glaucescent, subcæspitose, lineari-laciniate, laciniæ lax, diffuse*, sub-ascending, *margin nigro-fibrilloso-ciliate, under surface* subcanaliculate or plane, *albo-granulose;* apothecia cæsio-pruinose, margin radiato-coronate; spores 8, fuscous, elongato-oblong, 1-septate; (thallus and medulla Ky Cy.)

Amongst grass, &c. 1813.

SYN :—Linn. Sp. Pl. ed. 3. 1613. (1764.) Ach. Syn. 222. Nyl. Syn. 414. Mudd Man. 104.
FIG :—E. Bot. 2548. Hepp Sporen t. 66. f. 573.
EXS :—Hepp 573. M. & N. 941. Bourgeau 298. Welw. Lusit. 79. Leight. 168. Larbal. 69.
GEOG. DISTRIB :—Europe, Asia, Africa, America, Australasia.
BOT. PROV :—1...16...31.
ENGLAND :—Babbicombe, Devonshire. *Sir W. J. Hooker.* Torquay! *Dr. Deakin.* Cornwall! *Mr. Borrer.* Bolt Head, S. Devon. *Dr. Holl.*
IRELAND :—Ballycotton! near Cork and on Cape Clear Island. *Mr. Carroll.*
CHANNEL ISLANDS :—Jerbourg and S.W. point of Rocquaine Bay. *Mr. Lukis.* Grosnez Castle, Quenvais, Jersey! Bruchere. *Mr. Larbalestier.*
"Spores .035—.060 mm. long, .018—.025 mm. broad." (*Nyl.*)

11. *P. speciosa*, (Wulf.) *white* or albo-cinerascent, *stellato-laciniate*, laciniæ *narrow, multifid, plane*, sub-imbricate, somewhat ascending at the apices, *under surface plane albo-flocculose*, rhizinæ and marginal ciliæ whitish; apothecia fuscous, margin sub-entire or crenulate, incurved; spores 8, fuscous, oblong, 1-septate; (medulla K yellow C yellow).

On trees and rocks. 1809.

SYN :—Wulfen in Jacq. Coll. 3. 119. (1789.) Ach. Syn. 211. Nyl. Syn. 416. Mudd Man. 107.
FIG :—E. Bot. 1979.
EXS :—M. & N. 635. Schær. 357. Tuck. 81. Spruce Amaz. 154. Anzi Langob. 56.
GEOG. DISTRIB :—Europe, Asia, Africa, America, Polynesia, Australasia.
BOT. PROV :—1...15, 16 . 19...30, 31.
ENGLAND :—Poldesco, Cornwall. *Mr. Borrer.* Bolt Head, S. Devon. *Dr. Holl.*
SCOTLAND :—Ballacheulish, near Fort William. *Messrs. Turner and Hooker.* Glen Falloch. *Dr. Holl.* Appin. *Rev. J. M. Crombie.*
IRELAND :—Dunkerron. *Dr. Taylor.* Glenarm, co. Antrim. *Dr. Moore.*
CHANNEL ISLANDS :—Jerbourg, Guernsey. *Rev. T. Salwey.* Rozel, Jersey. *Mr. Larbalestier.*
"Spores .004 to .0045 in. long, by .00175 to .002 in. broad." (*Mudd.*) "Spores .025—36 mm. long, .012—17 mm. broad." (*Nyl. & T. M. Fr.*)

Var. *hypoleuca*, (Ach.) under surface of thallus white, *rhizinæ and marginal ciliæ black.*

On rocks. 1875.

SYN :—Ach. Syn. 211. (1817.) Nyl. Syn. 417.
FIG :—Fée Ess. Suppl. t. 38. f. 2.
EXS :—Wright 80. Spruce 152. 153.
GEOG. DISTRIB :—North and Central America, Cape of Good Hope, Island of Bourbon, East Indies, Java, Cuba, Ceylon, Mauritius.
BOT. PROV :—15...26.
SCOTLAND :—Glencroe ! *Dr. Macmillan.* (1875.)
IRELAND :—Dawros River ! *Mr. Larbalestier.*

12. *P. erosa*, (Borr.) greyish or glaucous-white, *crowded, imbricate, rotundo-abbreviato-laciniate, minutely-albo-granulate, margins* of laciniæ *minutely jagged or crenulate*, frequently ascending and granulate ; apothecia fuscous-black, margin sub-entire ; spores 8, fuscous, oblong, 1-septate ; (thallus Ky Cy).

On trees, walls, &c. 1837. rare.

The surface of the thallus is minutely albo-granulate not subcortically albo-maculate as in *P. stellaris* and its varieties.

SYN :—E. Bot. Suppl. 2807. (1837.) *tribacia* (in part), Ach. Syn. 191. Nyl. Syn. 425.
FIG :—E. Bot. Suppl. 2807.
EXS :—Larb. 24. Arn. 272. 248. Leight. 266.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...5...7...10...15, 16...19...31.
ENGLAND :—Hurstpierpoint, Sussex. *Mr. Borrer.* near Ayton, Cleveland. *Mr. Mudd.* Ludlow Castle, Shropshire. *Rev. T. Salwey.* Plymouth ! *Mr. Holmes.* Treveneth, near Penzance. *Mr. Curnow.*
SCOTLAND :—Connel Ferry, Argyleshire. *Mr. Borrer.* Will's Braes ; Auldbar. *Mr. Gardiner.*
IRELAND :—Dargle. *Dr. Taylor.*
WALES :—Llanaber ! near Barmouth. *Rev. T. Salwey.* Aberdovey !
CHANNEL ISLANDS :—Quenvais ; St. Ouen's Bay ! Jersey ! *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

13. *P. astroidea*, (Clem.) greyish-white, orbicular, thin, closely appressed, *almost entirely granulose or leprose*, laciniato-effigurate at the circumference ; apothecia fuscous-black, naked or pruinose ; spores 8, fuscous, elliptico-oblong, 1-septate, cells nucleolate ; (medulla Ky Cy).

On trees, rare. 1807.

SYN :—Clem. Ens. (add.) 302. (1807.) *P. Clementiana*, Ach. Syn. 204. Nyl. Syn. 426. Mudd Man. 108.
FIG :—E. Bot. 1779. Linn. Trans. t. 13. f. 1. Hepp Sporen t. 69. f. 601.
EXS :—Hepp 601. Schær. 610. M. & N. 737. Welw. Lusit. 104. Anzi Langob. 9.
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—1, 2, 3, 4...7, 8...10...19...24 ..31.
ENGLAND :—Sussex ! Tunbridge Wells and Southampton. *Mr. Borrer.* Penzance ! *Rev. T. Salwey.* near Settle. *Dr. Windsor.* near Stokesley, Cleveland. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* Twycross, Leicestershire ! West Haddon, Northamptonshire. *Rev. A. Bloxam.* Plymouth ! Broom Park, near Sibertswold ! Kent. *Mr. Holmes.*
IRELAND :—Tervoe near Limerick ! and Dinis, Killarney. *Mr. Carroll.* Dunkerron ; Blackwater Bridge, Kerry. *Dr. Taylor.*
WALES :—Barmouth ! *Rev. T. Salwey.*
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*
"Spores .0045 in. long, by .0015 to .002 in. broad." (*Mudd.*) "Spores .017—26 mm. long, .008—.011 mm. broad." *(Nyl.)*

Var. *elegans*, (Nyl.) albo-glaucescent, *margins of laciniæ delicately isidioso-fimbriate*,

IRELAND :—South side of Kylemore Lake, Galway. *Mr. Larbalestier.* (1876.)

14. *P. tribacoides*, (Nyl.) nearly similar to *P. tribacia*, (Ach.) Nyl. but the white soredia arranged as those of *P. cæsia*, and the thalline and medulline reaction with K+; apothecia insufficiently developed.

On young trees. 1874.

SYN :—Nyl. in Flora 1874, p. 307.
GEOG. DISTRIB :—Western France.
BOT. PROV :—2.
ENGLAND :—Near Ryde, Isle of Wight. *Rev. J. M. Crombie*. 1874.

§§§ *medulla Ky C—*.

15. *P. stellaris*, (L.) *white or albo-glaucescent*, orbicular, *stellari-appressed*, laciniæ multifid, contiguous, *subcortically albo-maculate*, under surface whitish with concolorous or fuscescent or nigricant fibrillæ; apothecia fuscous-black or black, naked or cæsio-pruinose, margin entire or obsoletely crenulate; spores 8, fuscous, oblong, 1-septate; cells nucleolate.

All the varieties or forms of *P. stellaris* may be recognized by the sub-cortically albo-maculate thallus.

On trees. 1724.

SYN : -Linn. Sp. Pl. 1. ed. No. 27. (1753.) Ach. Syn. 215. Nyl. Syn. 424.
FIG :—Reich. and Schub. 86. Hffm. En. t. 13. f. 1. 2. Tul. Mem. t. 1. f. 8—16.
EXS :—M. & N. 163. Schær. 350. 351. Mudd 79. Mass. 318. Fellm. 87. Hepp 877. Bohl. 103. Anzi It. S. 117. Leight. 6.
GEOG. DISTRIB :—Europe, Asia, Africa, N. America, Australasia.
BOT. PROV :—1...3, 4, 5, 6, 7...10, 11...14, 15...19...31.
ENGLAND :—Near Ayton! *Mr. Mudd*. Oswestry! *Rev. T. Salwey*. Yorkshire! *Mr. Dixon*. Essex. *Mr. Pigott*. Ravensworth and Cawsey Woods! West Dipton near Hexham and Oak Wood near Wylam, Northumberland. *Mr. Winch*. Devon. *Mr. Parfitt*. Kelvedon, Essex. *Mr. Varenne*. Midland Counties. *Mr. Purton*. Bedfordshire. *Rev. C. Abbot*. Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Guestling, Sussex. *Rev. E. N. Bloomfield*. Tetsworth! Oxfordshire! *Mr. Larbalestier*. Malvern. *Mr. Lees*. Sutton! Berwick! Ensdon! Pulley! Shropshire.
SCOTLAND :—Glen Nevis. *Dr. Lindsay*. Forfarshire. *Mr. Gardiner*. Swanston Wood, near Edinburgh. *Dr. Greville*.
IRELAND :—Great Island, Cork. *Mr. Carroll*.
WALES :—Barmouth! Aberystwith. *Miss Atwood*. Llanbedrog! Edderton! Forden, Montgomeryshire. near Tremadoc!
"Spores .004 in. long, by .00175 to .002 in. broad." *(Mudd.)* "Spores .016—23 mm. long, .008—.011 mm. broad." (*Nyl.*) "Spores .016—24 mm. long, .008—11 mm. broad." (*T. M. Fr.*)

Var. *leptalea*, (Ach.) narrowly laciniate, *laciniæ appressed, subcortically albo-maculate, margins albo- or fuscescenti-fibrilloso-ciliate*.

On trees and stones.

SYN :—Ach. Meth. 198. (1803.) Syn. 221. Nyl. Syn. 425.
FIG :—Jacq. Coll. 4. t. 6. f. c.
EXS :—Schær. 562. 349. Welw. Lusit. 73. Anzi It. S. 118. M. & N. 450 b. (in part). Reich. & Schub. 37.
GEOG. DISTRIB :– Europe.
BOT. PROV :—3...5...7...10, 11...(19—30).
ENGLAND :—Oswestry! *Rev. T. Salwey*. Ulting near Maldon! *Mr. Piggott*. Yorkshire! *Mr. Dixon*. near Gainford, Durham. *Rev. J. Harriman*. Pontesford Hill! Shropshire.
SCOTLAND :—Grampians, common. *Rev. J. M. Crombie*.
IRELAND :—On trees and stones, frequent. *Mr. Carroll*.
WALES :—Edderton! Montgomeryshire.

Var. *tenella*, (Scop.) narrowly laciniate, *subcortically albo-maculate, effuse*, crowded, *ascending, tubuloso-inflated or fornicate at the apices*, margins albo-fibrilloso-ciliate.

On trees and stones. 1724.

SYN :—Scop. Carn. 1406. (1760.) Ach. Syn. 221. Nyl. Syn. 426.
FIG :—E. Bot. 1351.
EXS :—Schær. 352. Mudd 78. M. & N. 450 a. Hepp 879. Anzi It. S. 119. Bohl. 20.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3, 4, 5, 6, 7, 8...10, 11...14...19, 20...26...31.
ENGLAND :—Ulting near Maldon! *Mr. Piggott.* Twycross! Leicestershire! *Rev. A. Bloxam.* near Ayton! and Stokesley! Cleveland. *Mr. Mudd.* Holy Island, Northumberland. *Mr. Winch.* Ide, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Haughmond Hill! Llanymynech Hill! Shropshire.
SCOTLAND :—On branches of trees. *Sir W. J. Hooker.* Swanston Wood; Pentland Hills. *Dr. Greville.*
IRELAND :—Great Island, Cork! Ballynagarde, Limerick. *Mr. Carroll.* S. side Kylemore Lake. *Mr. Larbalestier.*
WALES :—Llandrindod! *Rev. T. Salwey.* Borth! Cardiganshire! Y Figlefawr! near Barmouth. Castell Diganwy!
CHANNEL ISLANDS :—Guernsey! *Rev. T. Salwey.* Jersey. *Mr. Larbalestier.*

Var. *cæsia*, (Hffm.) whitish or albo-glaucescent, or albo-cæsious, stellato-orbicular, multifido-laciniate, laciniæ narrow, convex, contiguous, *subcortically albo-maculate, aspersed with cæsious or albo-cæsious pulvinate soredia.*

On trees, &c. 1793.

SYN :—Hffm. Enum. 65. (1784.) Ach. Syn. 216. Nyl. Syn. 426. Mudd Man. 107.
FIG :—E. Bot. 1052. Hffm. En. t. 12. f. 1. Pl. L. t. 8. f. 1.
EXS :—Anzi It. S. 121. Schær. 348. 347. M. & N. 447. Anzi Langob. 312. Leight. 323. Rabh. 930.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—1...3, 4, 5...7...11...14, 15, 16...(19—30)...31.
ENGLAND :—Burgh and Bradwell, Suffolk; and Acle, Norfolk. *Mr. Turner.* Richmond House, Richmond Park. *Mr. Sowerby.* Penzance! *Rev. T. Salwey.* Gainford; Fawdon Slate, Durham; West Dipton near Hexham, Northumberland. *Mr. Winch.* Malvern Hills. *Dr. Holl.* Exeter. *Mr. Parfitt.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Swinnop, East Allendale, Northumberland. *Rev. W. Johnson.* Church Stretton! Shropshire.
SCOTLAND :—King's Park, Edinburgh. *Dr. Greville.* Craig Tulloch; Appin. *Rev. J. M. Crombie.*
IRELAND :—On rocks frequent. *Mr. Carroll.*
WALES :—Aberdovey! *Rev. A. Bloxam.* between Towyn and Craig Aderyn! Barmouth!
CHANNEL ISLANDS :—Guernsey! *Rev. T. Salwey.* Jersey, &c. *Mr. Larbalestier.*

Var. *sub-obscura*, (Nyl.) cinerascent, similar to *cæsia*, but without soredia.

LOCALITIES :—On granite rocks, La Moye! Jersey. Leanane! Galway. *Mr. Larbalestier.* (1876.)

Var. *fimbriatula*, (Strtn.) Similar to *P. tenella*, but with longer narrower laciniæ and generally albo-sorediate extremities, fibrilloso-ciliate on the margin, the ciliæ long and most frequently digitato-divided at their extremities.

On rocks. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 85. (1875.)
SCOTLAND :—Ben Lawers. *Dr. Stirton.* (1875).

§§§ *medulla K purple.*

16. *P. endococcina*, (Kbr.) *glaucescent, medulla yellow-red*, K *purple*, subcartilaginous, stellate, appressed, multifido-laciniate, epruinose, laciniæ narrow, plane, linear, under surface black, sparsely fibrillose; apothecia fuscous, black, naked, margin entire; spores 8, griseo-fuscous, oblong, 1-septate.

On rocks, rare.

SYN:—Kbr. Par. 36. (1865.) Mudd Herb. Brit. Mus. see Crombie in Journ. Bot. n. s. I. 359.

EXS:—Arn. 533. Lojka 1519.

GEOG. DISTRIB:—Transylvania.

BOT. PROV:—10.

ENGLAND:—Yorkshire. *Mr. Mudd.*

C. *thallus fuscescent*, K—C—.

17. *P. aquila*, (Ach.) *castaneo-fuscescent*, opake, sub-orbicular, appressed, narrowly laciniate, *laciniæ lineari-multipartite*, plane or sub-convex, *stellate, imbricato-congested*, under surface pale, nigricanti-fibrillose; apothecia adnate, fuscous-black, *margin subentire or crenulate;* spores 8, fuscous, oblong, 1-septate; medulla K—C—.

On maritime rocks chiefly. 1741.

SYN.—Ach. Prod. 109. (1798). Syn. 205. Nyl. Syn. 422. Mudd Man. 111.

FIG:—E. Bot. 982. Hepp Sporen t. 69. f. 602.

EXS:—Schær. 565. Hepp 602. M. and N. 1049. Larb. 23. Anzi Langob. 10. Welw. Lusit. 70. Mass. 87. Bohl. 111. Leight. 144. Nyl. Pyr. Or. 28.

GEOG. DISTRIB:—Europe, Asia, N. America.

BOT. PROV:—1.. 5, 6, 7...14, 15...18...26...30, 31.

ENGLAND:—Cornwall. *Messrs. Turner and Sowerby.* Mynydd-y-Myfyr, near Oswestry! *Rev. T. Salwey.* Torquay. *Dr. Deakin.* Devon and Cornwall. *Sir W. J. Hooker.* Heugh, Holy Island and on Fern Islands, Northumberland. *Mr. Winch.* Hartley Bates. *Mr. Thornhill.* Hudshead, Northumberland. *Dr. G. Johnston.* Lustleigh Cove, Devon. *Mr. Parfitt.* North Bovey, Hightor Downs; Blackstone rock; Doddiscombes leigh, Devon. *Messrs. Jones and Kingston.*

SCOTLAND:—Moncrieff Hill, near Perth. *Dr. Lindsay.* near Montrose. *Dr. Maingay.* Aberfeldy. *Rev. H. Macmillan.* King's Park, Edinburgh. *Rev. J. Lightfoot.* Hermitage and Pentland Hills. *Mr. Maughan.* Twin Hill; Lundie Craigs. *Mr. Gardiner.* Stennis, Orkney. *Dr. Lindsay.* coast of Fife between Burntisland and Kirkaldy; near Granton; Cramond Island. *Dr. Greville.* Kincardineshire. *Rev. J. M. Crombie.* Isle of May, Firth of Forth. *Mr. Sadler.*

IRELAND:—Near Ardglass co. Down. *Dr. Maingay.* on maritime rocks, common. *Mr. Carroll.* Dawros River! co. Galway. *Mr. Larbalestier.*

WALES:—Anglesea. *Rev. H. Davies.* Aberdovey and near Beaumaris. *Rev. A. Bloxam.* Bangor! Barmouth! Moel-y-Golfa! Cromlech, Manorbeer! Gimlet Rock! Pwllheli; Goodwick Bay! near Fishguard, Pembrokeshire; Criccieth Castle!

CHANNEL ISLANDS:—Petit Port, Jersey! and all the Islands. *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

"Spores .007 in long, by .0035 in. broad." *(Mudd).* "Spores .032—44 mm. long, .018—26 mm. broad." *(Nyl)* "Spores .030-44 mm. long, .018—25 mm. broad." *(T. M. Fr.)*

## TRIBE XIII. GYROPHOREI.

Characters the same as those of the only genus *Umbilicaria.*

### I. UMBILICARIA, *Hoffm.*

Thallus membranaceous, monophyllous, umbilically affixed. Apothecia simply lecideine or patellaroid, complicato-compound

or gyrose. Paraphyses distinct. Sterigmata articulate. Spermatia slender, shortly cylindrical, obtuse at both apices.

1. *U. pustulata*, (Hoffm.) *thallus thin*, torn and lobed, papillose and naked on both sides; upper side pale olive-green, *blistered and sprinkled with fibrous glomeruli; under side brownish, deeply foveolate*; spores one or two, very large, oblong, pale, wrinkled or reticulated on the surface; medulla K—C red.

On rocks and stones in mountainous districts, not uncommon. 1741.

SYN :—Hffm. Pl. l. 13. (1794.) *Gyrophora*, Ach. Syn. 66. Nyl. Lich. Scand. 113. Leight. Brit. Umbil. 22. Mudd Man. 115.

FIG :—Hffm. Pl. L. t. 28. f. 1. 2. E. Bot. 1283. Leight. Brit. Umbil. Fig. 1. Hepp Sporen t. 14. f. 118.

EXS :—Bohl. 125. Schær. 156. Hepp 118. Breutel 201. Larbal. 25. Maudon 22. Anzi Langob. 297. M. & N. 60. Welw. Lusit. 21. 32. 107. Rabh. 838. Reich. and Schub. 29. Leight. 166.

GEOG. DISTRIB :—Europe, Africa, N. America.

BOT. PROV :—1...5, 6, 7, 8, 9, 10...12...16...19...22...31.

ENGLAND :—Malvern Hills. *Mr. Stokes.* near Biddiston Lighthouse, Cheshire. *Mr. Bradbury.* near Halifax. *Mr. Bolton.* Dartmoor! Devonshire. (fruit). *Sir W. J. Hooker.* Hay Tor! on rocks in river near Two Bridges public house, Devon! Dartmoor! *Mr. Borrer.* Blackstone Rock, Devon. *Mr. Parfitt.* Shaftoe Crags! *Sir W. C. Trevelyan.* Sugar Loaf Mountain, Monmouth. *Mr. Jacob.* Westmoreland. *Mr. Martindale.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.* Hightor rocks; Scobitor rocks, near Widdecombe; Bottor rock, Devon. *Messrs. Jones and Kingston.* Nescliffe! Caer Caradoc! Grinshill! Shropshire.

SCOTLAND :—Highland Mountains. *Rev. J. Lightfoot.* Loch Slichagan! Isle of Skye. *Mr. Borrer.*

IRELAND :—Glengariff near Bantry, (fruit). *Miss Hutchins.* Ireland. *Dr. Taylor.* Migen Head. *Mr. Wright.* Lough Dan co. Wicklow. *Adm. Jones.*

WALES :—By the road from Penmorfa to Dolbenmaen, and under Keven Lees Castle, *Dillenius.* Old Wall, about half way between Caernarvon and Beddgelert. *Rev. H. Davies.* Nant Gwynant Vale near Snowdon. *Messrs. Turner & Borrer.* Moel Hebog! *Mr. Borrer.* Cwm Bychan near Barmouth. *Rev. T. Salwey.* Drwsycoed near Nantlle, Cardiganshire. *Miss Atwood.* Trefriw! Black Rock! near Criccieth.

CHANNEL ISLANDS :—Gorey and La Moye, Jersey; *Mr. Larbalestier.* near Petit Bo, Guernsey. *Mr. Lukis.*

Consult Flora 1875 p. 303. "Spores .007 to .01 in. long, by .005 to .007 in. broad, t. 2. f. 35." *(Mudd.)* "Spores .028—70 mm. long, .018—28 mm. broad." *(Nyl.)* "Spores .040—70 mm. long, .018—34 mm. broad." *(T. M. Fr.)* Spores .037 mm. long, .018 mm. broad.

2. *U. polyphylla*, (L.) *dark greenish-copper colour, thin, unequally lobed, naked and smooth on both surfaces, under* surface *black*; apothecia slightly complicate; spores 8, colourless, ellipsoid, simple; medulla K—C faint red.

On mountainous rocks, not uncommon. 1741.

SYN :—Linn. Sp. Pl. ed. 1. No. 55. (1753.) Nyl. Scand. 119. Leight. Br. Umbil. 6.

FIG :—E. Bot. 1282. Hffm. t. 59. f. 2. Leight. Br. Umbil. f. 2.

GEOG. DISTRIB :—Europe, Asia, America.

BOT. PROV :—1...5...7, 8, 9, 10, 11, 12...14, 15...17...19.

Forma *monophylla*, T. & B. thallus of a single peltate leaf.

SYN :—T. & B. Lich. Brit. 214. (1813.) Leight. Br. Umbil. 6. Mudd Man. 116.

FIG :—Hepp Sporen t. 83. f. 717.

EXS :—Hepp 717. M. & N. 342. (in part) Schær. 149. Leight. 65. Mudd 87.

ENGLAND :—Cheshire and Cornwall. *T. & B. Lich. Brit.* Yorkshire! *Mr. Dixon.* Ingleby and Howden Gill! Cleveland. *Mr. Mudd.* near Todmorden and on Ingleborough. *Dr. Carrington.* near Newcastle. *Mr. Thornhill.* Mynydd-y-Myfyr, near Oswestry. *Rev. T. Salwey.* Abbey St. Bathans! Weardale! Blanch-

land and near Hunt Hall, Teesdale. *Sir W. C. Trevelyan.* Cheviot; Hedgehope; Shaftoe and Roadley Crags near Wallington, Northumberland. *Mr. Winch.* Eglestone, Healey Field, and Conset Park, Huntersley Peak between Wasterley Park and Hishope, Durham. *Mr. Thornhill.* Westmoreland; Cronkley, Yorkshire. *Mr. Martindale.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.* Blackstone Rock, Devon. *Dr. Dickie.* Bidstone Hill, Cheshire. *Rev. H. H. Higgins.* West Allen Carrs, Northumberland. *Rev. W. Johnson.* Wrekin! Arcoll! Stiperstones Hills! Caer Caradoc! Long Mynd! Shropshire.

SCOTLAND:—Clova! Craig Koynoch! *Mr. Gardiner.* Ben Mac Dhui, Braemar! Birnam Hill; Craig-y-Barns; Dunkeld; Glen Dee. *Dr. Lindsay.* Aviemore; Ben Nevis. *Adm. Jones.* Inchnadarnf! Sutherland. *Sir W. C. Trevelyan.* Braemar and Lochaber. *Rev. J. M. Crombie.*

IRELAND:—Luggelaw. *Adm Jones.*

WALES:—Cellfawr near Barmouth! *Rev. T. Salwey.* Llyn Llydaw; Llyn Cwm y Ffynnon las; Cwm Brwynog near Llanberis. *Dillenius.* Glyder Vach! Cwm Tryfaen! Cwm Bochllwyd! Pass of Llanberis! Arran Mowddwy!

"Spores .003 to .0035 in. long, by .001 to .0015 in. broad, t. 2. f. 36." (*Mudd.*) "Spores .013—18 mm. long, .007—8 mm. broad." (*Nyl.*) "Spores .012—18 mm. long, .005—8 mm. broad." (*T. M. Fr.*)

Forma *congregata*, (T. & B.) thallus small, *clustered*, much curled, edges erect or reflexed.

SYN:—T. and B. Lich. Brit. 214. (1813). Leight. Br. Umbil. 7.

EXS:—Anzi. It. S. 79. Leight. 313. Reich. and Schub. 128.

BOT. PROV:—5...7...10...12.

ENGLAND:—Mynydd-y-Myfyr near Oswestry! *Rev. T. Salwey.* Battersby Moor! Cleveland. *Mr. Mudd.* Ramshaw Rocks! near Warslow, Staffordshire. *Rev. A. Bloxam.* Maze Beck! Westmoreland. *Mr. Robertson.* Wrekin! Arcoll Hills! Shropshire.

WALES:—Cwm Tryfaen! Pass of Llanberis! Aran Mowddwy! Cwm Bochllwyd! Glyder Vach!

The states *monophylla* and *congregata* grow together in some abundance on the Wrekin and adjoining hills, and may be seen passing into each other by every degree of gradation.

Forma *sulcata*, (T. & B.) upper surface of thallus marked with *superficial cracks.*

SYN:—T. and B. Lich. Brit. 214. (1813). Leight. Br. Umbil. 7.

SCOTLAND:—On Ben Ferg! by Loch Ericht, Invernessshire. *Mr. Borrer.* Clova! *Mr. G. Lawson.*

"*Thallus* somewhat thicker than in f. *monophylla*, simple or more or less compound; *upper surface* marked with a few superficial undulating indented lines, the edges of which occasionally separate so as to leave a smooth black interstice, *under surface* as in *monophylla* but more commonly blotched with the paler colour of the upper side."—*Lich. Brit.*

This state seems apparently a transition to *hyperborea.*

Forma *lacera*, (Leight.) thallus very deeply divided, divisions *lacero-lobate.*

SYN:—Leight. Br. Umbil. 8. Mudd Man. 116.

EXS:—Hepp 718.

SCOTLAND:—Craig Koynoch! *Mr. Gardiner.* Scotland! *Mr. G. Lawson.* Grampians. *Rev. J. M. Crombie.*

WALES:—Bettws-y-coed!

The mode of division of the margins of this state is different from that of the preceding ones, and assimilates to that observable in *anthracina.*

3. *U. flocculosa*, (Wulf.) greenish copper-colour, simple or clustered or squamigerous, thin, unequally lobed, edges sometimes ragged and erose, *upper surface dotted and rough with sooty granulations, under surface black naked pitted;* apothecia slightly complicate; spores 8, colourless, oblongo-ellipsoid, simple; medulla K—C red.

On mountainous rocks, not uncommon. 1785.

SYN :—Wulf. in Jacq. Coll. 3. 99. (1789.) T. & B. Lich. Brit. 217. Leight. Br. Umbil. 8. Nyl. Scand. 119. Mudd Man. 116.
FIG :—E. Bot. 2483. Hffm. Pl. L. t. 68. f. 1—4. Leight. Br. Umbil. fig. 4.
EXS :—Anzi Langob. 60. It. S. 81. Schær. 152. Hepp 115. M. & N. 443. Leight. 219.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5...8...10, 11...14, 15, 16.
ENGLAND :—Northern Counties! Eglestone, Durham. *Rev. J. Harriman.* Whitwick Rocks! Leicestershire. *Rev. A. Bloxam.* Yorkshire. *Mr. Dixon.* Dartmoor. *Messrs. Jones and Kingston.* Caer Caradoc! Shropshire.
SCOTLAND :—Highlands. *Mr. Dickson.* Corstophine and Craiglockart Hills. *Dr. Greville.* Ben Nevis! Ben Cruachan! *Mr. Borrer.* Appin. *Rev. J. M. Crombie.*
"Spores .018—27 mm. long, .007—9 mm. broad." (*Nyl.*) "Spores .015—21 mm. long, .007—8 mm. broad." (*T. M. Fr.*)

4. *U. hyperborea*, (Ach.) dark greenish-brown, thin, jagged, and somewhat lobed, slightly perforated, naked on both sides, *upper surface rugoso-pustulate*, under surface blackish-brown, nearly smooth, *slightly lacunose*; apothecia complicate; spores 8, colourless, ellipsoid, simple; medulla K—C red.

On alpine rocks, very rare. 1790.

SYN :—Ach. Kongl. Vet. Acad. N. H. 15. p. 89. (1794.) Syn. 66. Nyl. Lich. Scand. 118. Leight. Br. Umbil. 10. Mudd Man. 117.
FIG :—Hffm. Pl. L. t. 71. Leight. Br. Umbil. fig. 5. and 5. a. Hepp Sporen t. 14. f. 116.
EXS :—Schær. 150. 151. Hepp 116. Fellm. 90. M. & N. 1047. Anzi It. S. 78. Fr. 126. Rabh. 884.
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—9...15...19.
ENGLAND :—Clougha, Lancashire. *Mr. Jacob.*
SCOTLAND :—Scotch Mountains! *Mr. Dickson in herb. Borrer.* By the Truim, near Dalwhinnie, Invernessshire. *Mr. Brodie.* Invercauld. *Adm. Jones.* Ben Nevis; Lochaber; Morchone; Ben Mac Dhui, Braemar. *Rev. J. M. Crombie.*
IRELAND :—Brandon Mountains, Kerry. *Dr. Moore.*
Mr. Borrer sought for the plant in vain in the particular station specified by Mr. Brodie.
"Spores .003 in. long, by .0015 in. broad." (*Mudd.*) "Spores .013—16 mm. long, .007—8 mm. broad." (*Nyl.*) "Spores .010—16 mm. long, .005—8 mm. broad." (*T. M. Fr.*) Spores .009 mm. long, .0045 mm. broad.

5. *U. arctica*, (Ach.) dark greenish-brown, thickish, slightly lobed, crenate, naked, *upper surface granulato-corrugate*, under surface pallescent, *minutely depresso-granulate*; apothecia complicate; spores 8, colourless, ellipsoid, simple; medulla K—C red.

On alpine rocks, very rare. 1798.

SYN :—Ach. Meth. 106. (1803.) Syn. 65. Nyl. Lich. Scand. 116. Leight. Brit. Umbil. 11. Mudd Man. 117.
FIG :—E. Bot. 2485. Ach. Meth. t. 2. f. 6. Leight. Br. Umb. f. 6.
EXS :—Schær. 556. Th. M. Fr. 65. Fellm. 91. Breutel 112. Rabh. 878. Smrft. 140.
GEOG. DISTRIB:—Europe, N. America.
BOT. PROV :—1...11...15.
ENGLAND :—Rocks in co. Durham! *Mr. Robson in herb. Borrer.*
SCOTLAND :—Lochnagar. *Dr. Lindsay.* Ben More in Breadalbane; Morrone in Braemar. *Rev. J. M. Crombie.*

6. *U. erosa*, (Web.) greenish-brown, thickish, *splitting when old into two or three laminæ, jagged* and somewhat lobed, *perforated*, upper surface naked, divided by *flexuose anastomosing black*

*indented lines*, with convex areolæ, under side paler, *coarsely papillose, separately perforated, laciniato-fibrillose;* apothecia complicate; spores 8, colourless, ellipsoid, simple; medulla K—C red.

On alpine rocks, frequent. 1741.

SYN :—Web. Spicil. 259. (1778.) Ach. Syn. 65. Nyl. Lich. Scand. 118. Leight. Br. Umbil. 12. Mudd Man. 117.

FIG :—E. Bot. 2066. Hffm. Pl. L. t. 70. Leight. Br. Umbil. fig. 7.

EXS :—Tuck. 48. M. & N. 250. Schær. 153. Bohl. 19. Reich. and Schub. 129.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—1...5...7...10, 11 ..15...19...23...26.

ENGLAND :—St. Vincents Rocks near Bristol. *Mr. Hudson.* Durham; Yorkshire. *Sir J. E. Smith.* Birkdale, Westmoreland! *Mr. Robertson.* Dartmoor! *Mr. Borrer.* Swinhope Fell, Durham! *Mr. Mudd.* Stansfield Moor near Halifax. *Mr. Brunton.* Huntersley Peak, north west of Waskerley Park; Blackburn near Eglestone, Durham; Cronkley Fell; Cheviot and Hedgehope, Northumberland. *Mr. Winch.* Tors about Dartmoor. *Rev. Mr. Newberry.*

SCOTLAND :—Highlands. *Rev. J. Lightfoot.* Vitrified forts in the Highlands. *Sir J. E. Smith.* Corry Leese, Ben Nevis! *Mr. Borrer.* Ben Beek! Craig Koynoc! *Mr. Gardiner.* Clova! *Mr. Lawson.* Aviemore. *Adm. Jones.* Lochnagar. *Dr. Lindsay.* Ben Lawers. *Dr. Maingay.* Inchnadamff! *Sir W. C. Trevelyan.* Braemar. *Rev. J. M. Crombie.*

IRELAND :—Mangerton and other Mountains. *Dr. Taylor.* Slieveleor, Mayo. *Dr. Moore.* Luggelaw. *Adm. Jones.* summit of Doughruagh! Galway. *Mr. Larbalestier.*

WALES :—Llanberis. *Rev. Hugh Davies.* North Wales. *Sir J. E. Smith.* Capel Curig! *Mr. H. Piggot.* Cellfawr near Barmouth. *Rev. T. Salwey.* Cwm Tryfaen! Cwm Bochlwyd! Cwm Ffynnon lloer! and Cwm Ffynnon Llugwy!

"Spores .003 in. long, by .0015 in. broad." (*Mudd*) "Spores .011—12 mm. long, .007 mm. broad." *(Nyl.)*

7. *U. polyrhiza*, (L) greenish-copper colour, *smooth*, thin, unequally lobed and crenate, *under surface black, papilloso-granulate, reticulated, fibrilloso-pannose;* apothecia gyroso-complicate; spores 8, colourless, elliptico-oblong, simple; medulla K—C red.

On alpine rocks, frequent.

SYN :—Linn. Sp. Pl. ed. 1. No. 56. (1753). Nyl. Scand. 120. *G pellita*, Ach. Syn. 67. Leight. Br. Umbil. 14. Mudd Man. 119.

FIG :—E. Bot. 931. Hffm. Pl. L. t. 26. f. 3. Leight. Br. Umbil. fig. 11.

EXS :—M. and N. 343. Mudd 89. Rabh. 811.

GEOG. DISTRIB :—Europe, Asia.

BOT. PROV :—1..7...9, 10, 11, 12...15...17.. 22.

ENGLAND :—Yorkshire. *Mr. Brunton.* Durham. *Rev. J. Harriman.* Cheshire. *Messrs. Turner and Borrer.* Cronkley. *Mr. Robertson.* near Lake Tumanel! Cumberland. *Mrs. Stanger.* Baysdale Moor; Highcliff; Ayton Moor! Cleveland. *Mr Mudd.* Shaftoe Crags, Hedgehope, Cheviot, and Hexham Fell, Northumberland; Mugglewick Fell, Cronkley Fell, Durham. *Mr. Winch.* Dartmoor. *Dr. Holl.* Blackstone rock; Hightor Downs, Devon. *Messrs. Jones and Kingston.*

SCOTLAND :—Highlands and Lowlands. *Rev. J. Lightfoot.* Clarlis Park and Paradise near Moneymusk, Aberdeenshire. *Withering.* Loch Phadrick! Craig Koynoch! Clova. *Mr. Gardiner.* Ben Ferrog! Llyn Canvay! *Mr. Borrer.* Clova! *Mr. Lawson.* Callernish, Lewis; Birnham Hill, Dunkeld; Lochnagar; between Persie and Spittal of Glenshee; Amulree. *Dr. Lindsay.* Penmanshiel! *Sir W. C. Trevelyan.* Glen Callater and Glen Dee in Braemar. *Rev. J. M. Crombie.* Ben Teagh! Rosshire. *Mr. Howie.*

IRELAND :—Tonlagee, co. Wicklow. *Dr. Taylor.*

WALES :—Llyn Llydaw, Snowdon; Llyn Cwm y Ffynnon las; Cwm Brwynog towards Arddu near Llanberis. *Dillenius.* Carnedd Llewelyn; Moel Siabod; *Mr. Griffith.* Cwm Bychan, Barmouth! *Rev. T. Salwey.* Cwm Ffynnon lloer! Cwm Ffynnon Llugwy!

"Spores .0035 in. long, by .001 to .0015 in. broad." *(Mudd.)* "Spores .008—.011 mm. long, .0045 mm. broad." *(Nyl.)* "Spores .008—11 mm. long, 004—5 mm. broad." *(T. M. Fr.)*

Var. *luxurians*, Ach. polyphyllous, complicate, deeply incised & laciniate.

On alpine rocks.

SYN :—*Gyrophora pellita var. luxurians*, Ach. L. U. p. 228. Crombie in Journ. Bot. n. s. 1. p. 359.
SCOTLAND :—Highlands. *Rev. J. M. Crombie.*

8. *U. grisea*, (Sw.) *ashy-grey or mouse-coloured*, thin, somewhat lobed, crenate, minutely *areolato-papillate*, under surface blackish, naked, *minutely granulato-areolate or scabrid*, granules pale as if rubbed ; apothecia gyrose ; spores 8, colourless, ellipsoid, simple ; medulla K—C red.

On maritime rocks, very rare. 1866.

SYN:—Swartz in Westr. Forsch. &c. 52. (1723.) Leight. Br. Umbil. 16. *G. murina*, Ach. Syn. 69. Nyl. Scand. 116. Mudd Man. 120.
FIG :—E. Bot. 2486. Chev. Paris. t. 14. f. 11. c. Leight. Br. Umbil. f. 14.
EXS: —M. & N. 736. Nyl. 130.
GEOG. DISTRIB :—Europe.
BOT. PROV :—31.
CHANNEL ISLANDS :—Beauport ! East Coast of Jersey ! *Mr. Larbalestier.*
"Spores .003 to .0035 in. long, by .001—.015 mm. broad." *(Mudd.)* "Spores .014—18 mm. long .008—.010 mm. broad." *(Nyl.)*

9. *U. proboscidea*, (L) *cinereo-nigrescent*, thin, crenate, slightly lobed, *pale pruinose*, grey in the centre where it is marked *with elevated, reticulated veins*, the other portion *rugose*, under surface *smooth, cinereo-pallescent ;* apothecia gyroso-plicate ; spores 8, colourless, ellipsoid, simple ; medulla K—C red.

On alpine rocks, frequent. 1741.

SYN :—Linn. Sp. Pl. p. 1150. Ach. Prod. 147. (1798.) Syn. 64. Nyl. Scand. 116. *deusta*, Leight. Br. Umbil. 17. 18. 19. Mudd Man. 118.
FIG :—E. Bot. 2484. Leight. Br. Umbil. fig. 15.
EXS :—Schær. 148. Anzi It. S. 77. Fr. 128. Tuck. 49.
GEOG. DISTRIB :—Europe, Asia, America.
BOT. PROV :—1..5...7...11...15...19...22.
ENGLAND :—St. Vincents Rocks. *Mr. Dare.* North of England. *Sir J. E. Smith.* summit of Hedgehope ! Northumberland ! *Dr. G. Johnston.* Cheviot ; Shaftoe Craigs, near Wallington, Northumberland ; High Force and Cronkley Fell, Teesdale, Harewood, Widdy Bank and Cauldron Snout, Durham. *Mr. Winch.* Blackstone Rock, Devon. *Mr. Ralfs.* Swinhope Fell, Durham. *Mr. Mudd.* Tors of Dartmoor. *Messrs. Jones and Kingston.*
SCOTLAND :—Highland Rocks. *Rev. J. Lightfoot.* Ben Lawers ! *Mr. Borrer.* Lochnagar ! Hills east of Glen Callater ! Ben Nevis ! *Dr. Lindsay.*
IRELAND :—Brandon, co. Kerry. *Miss Hutchins.*
WALES :—Rocks. *Sir J. E. Smith.* Cwm Tryfaen !
"Spores .0035 to .004 in. long, by .015 to .00175 in. broad." *(Mudd.)* "Spores .012—18 mm. long, .006—8 mm. broad." *(Nyl.)* "Spores .011—18 mm. long, .005—7 mm. broad." *(T. M. Fr.)*

forma *fimbriata*, (T. & B.) thallus edged with a few *black branched tooth-like fibres ;* medulla K—C red.

On alpine rocks.

SYN :—Turn. and Borr. Lich. Brit. 222. (1839.) Leight. Br. Umbil. 18. Mudd Man. 118.
EXS :—M. & N. 249.
ENGLAND :—Swinhope Fell ! Durham. *Mr. Mudd.*
SCOTLAND :—Highlands ; *Mr. Borrer.* between Glen Callater and Lochnagar ! *Mr. Tatham.* Clova ! Loch Phadrick ! *Mr. Gardiner.* Inchnadamff ! *Sir W. C. Trevelyan.*

IRELAND :—Glenmalure! co. Wicklow. *Mr. Carroll.*

Similar in substance, colour, and every other respect except in having the edges of the thallus here and there toothed and fringed with a few scattered black branching fibres. There are also occasionally a few fibres sprinkled over the underside.

forma *corrugata*, (Hoffm.) thallus thin, *rough with elevated reticulations;* medulla K—C red.

On alpine rocks.

SYN—Hoffm. Pl. Lich. 65. (1794.) T. & B. Lich. Brit. 222. Leight. Br. Umbil. 18. Mudd Man. 118.

FIG :—Hoffm. Pl. L. t. 43. f. 4. 7.

SCOTLAND :—Highlands! *Mr. Borrer.*

Similar in all respects, except in its upper surface having extremely prominent reticulations, rising to nearly a line in height, and looking like a series of erect curled squamæ.

forma *mesenteriformis*, (Wulf.) thallus thickish, upper surface *rough with elevated reticulations and somewhat papillose;* medulla K—C red.

On alpine rocks

SYN :—Wulfen in Jacq. Misc. 2. 85. (1781.) T. and B. Lich. Brit. 222. Leight. Br. Umbil. 19. Mudd Man. 118.

FIG :—Jacq. Misc. t. 9. f. 5.

EXS :—Schær. 147.

SCOTLAND :—Highlands! *Mr. Borrer.*

Upper surface of the thallus singularly rugose, almost papillose. The reticulations nearly as prominent as in *f. corrugata*, and sometimes growing out into leaves : substance considerably thicker than in the other state.

10. *U. cylindrica*, (L.) dull greenish-brown, or cinerascent, thickish, unequally lobed, *margins nigro-fibrilloso-ciliate*, *upper* surface *rugulose*, *under* surface *pallescent*, more or less fibrillose; *apothecia concentrico-gyrose*, podicellate ; spores 8, colourless, ellipsoid, simple ; medulla K—C—.

On alpine rocks, frequent.

SYN :—Linn. Sp. Pl. p. 1144. (1753.) Ach. Syn. 65. Nyl. Scand. 117. *proboscidea*, Leight. Br. Umbil. 19. Mudd Man. 118.

FIG :—E. Bot. 522. (two upper fig.) Hffm. Pl. L. t. 44. f. 1—6. Leight. Br. Umbil. fig. 16. 17. 18.

EXS :—Schær. 143. 146. Mudd 88. Zw. 206. Hepp 719. in part. Anzi It. S. 74. M. and N. 59. Breutel 113. Leight. 95.

GEOG. DISTRIB :—Europe, America, N. Holland.

BOT. PROV :—1...7...10, 11, 12...15, 16...18, 19...25, 26.

ENGLAND :—Dartmoor. *Mr. Newberry.* North of England. *Sir J. E. Smith.* Cheviots. *Mr. Winch.* summit of Hedgehope, Northumberland. *Dr. G. Johnston.* Birkdale! Westmoreland. *Mr. Robertson.* Scawfell! *Mrs Stanger.* Yorkshire. *Mr. Dixon.* Falcon Clints! Teesdale. *Mr. Mudd.* Fairfield, Westmoreland. *Mr. Martindale.* Crockern Tor, Devon. *Messrs. Jones and Kingston.*

SCOTLAND :—Goatfield, Isle of Arran; Breadalbane; Ben Nevis. *Rev. J. Lightfoot.* Loch Phadrick! Stroine-dhu! Summit of Carlowrie! *Mr. Gardiner.* Clova! *Mr. Lawson.* Morchone! Ben Mac Dhui! *Dr. Lindsay.* Long Island. *Prof. Balfour.*

IRELAND :—Connavalla. *Dr. Whitley Stokes.* Mangerton. *Dr. Taylor.* on mountain rocks, frequent. *Mr. Carroll.* summit of Doughruagh! co. Galway. *Mr. Larbalestier.*

WALES :—Llyn Llydaw! Llyn Cwm y Ffynnon las; Cwm Brwynog, near Llanberis; Berwyns. *Dillenius.* Carned Llewelyn. *Mr. Griffith.* Arran Mowddwy! *Mr. Borrer.* Cwm Bychan. *Rev. T. Salwey.* Snowdon, Llanberis ascent! Cwm Tryfaen! Cwm Bochlwyd! Cwm Ffynnon lloer! Cwm Ffynnon Llugwy! Arran Mowddwy! Crib Coch!

"Spores .003 in. long, by .0015 in. broad." *(Mudd.)* "Spores .010—14 mm. long, .006—8 mm. broad." *(Nyl.)* "Spores .012—16 mm. long, .007—8 mm. broad." *(T. M. Fr.)*

forma *denticulata*, (Ach.) margins of thallus *coarsely fringed and toothed;* medula K—C—.

On alpine rocks.

SYN :—Ach. Meth. 107. (1803.) Leight. Br. Umbil. 21. Mudd Man. 119.
FIG :—E. Bot. 522. (two lower fig.) Dill. t. 29. f. 116. B.
EXS :—Schær. 144.
SCOTLAND :—Loch Phadrick! Ben-na-Bourd! *Mr. Gardiner.* Clova! *Mr. Lawson.*
IRELAND :—Galtymore! co. Tipperary. *Mr. Carroll.*
WALES :—Arran Mowddwy! *Mr. Borrer.*
In all respects similar, except that the marginal fibres are coarser and larger, and more evidently a prolongation of the thallus.

forma *denudata*, (T. & B.) margins of thallus almost *naked;* medulla K—C—.

On alpine rocks.

SYN :—Turn. and Borr. Lich. Brit. 219. (1813.) Leight. Br. Umbil. 21. Mudd Man. 119.
FIG :—Hffm. Pl. L. t. 44. f. 7.
EXS :—Schær. 145,
ENGLAND :—Falcon Clints! Westmoreland Mountains! *Mr. Borrer.*
SCOTLAND :—Highlands. *Messrs. Turner & Borrer.*
WALES :—Summit of Glyders! *Mr. Borrer.*

forma *exasperata*, (T. & B.) thallus *polyphyllous*, ragged, *upper surface rugose*, margins *undulate and crisped;* medulla K—C—.

On alpine rocks.

SYN :—Turn. & Borr. Lich. Brit. 219. (1813.) Leight. Br. Umbil. 22. Mudd Man. 119.
ENGLAND :—Durham. *Mr. Robson.*
SCOTLAND :—Clova! *Mr. G. Lawson.*
Remarkably curled and undulated, and divided into numerous small irregular laciniæ; upper surface remarkably rough.

## SERIES V. PLACODEI.

Thallus crustaceous, squamose, radiate, granulose, powdery or evanescent. Apothecia lecanorine or lecideine, or biatorine or lirelliform.

## TRIBE XIV. LECANOREI.

Thallus various. Apothecia lecanorine or sub-lecanorine or pseudo-biatorine.

### SUB-TRIBE I. PSOROMEI.

Thallus variously squamulose, in texture conspicuously cellulose, gonidia distinct large. Apothecia lecanorine. Spores 8, colourless, large and simple. Paraphyses distinct. Spermogonia with arthrosterigmata.

### I. PSOROMA, *Fr. pr. p. Nyl.*

Thallus variously squamulose, cellulose, gonidia distinct, large. Apothecia lecanorine, margin crenate. Spores 8, colourless, large, ellipsoid, simple. Paraphyses distinct. Sterigmata pluri-articulate.

1. *P. hypnorum*, (Vahl.) *flavido-fuscescent or brownish-yellow, squamuloso-granulate*, squamulæ crenate or sub-granulose; apo-

thecia *rufous* or fuscescent, moderately large, *margin elevated granuloso-crenate;* spores 8, colourless, ellipsoid, apices rather acute, sub-crenulate.

On mosses or earth, not common. 1793.

SYN :—Vahl. in Fl. Dan. 6. t. 966. (1787.) Ach. Syn. 198. Nyl. Scand. 121. Mudd Man. 124.

FIG :—E. Bot. 740. Hffm. Pl. L. t. 63. f. 4—7.

EXS :—Schær. 546. Tuck. 20. Fr. 162. 339. Anzi Langob. 64. and 65. Larbal. 70. Fellm. 94. Reich. and Schub. 103.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—2, 3, 4, 5...11, 12, 13, 14, 15...19...30, 31.

ENGLAND :—Ludlow, Shropshire. *Dr. Babington.* Yarmouth. *Mr. Turner.* Castleton ! Cumberland. *Mrs. Stanger.* Oswestry, Shropshire. *Rev. T. Salwey.* Eglestone, Durham. *Rev. J. Harriman.* near Brighton, Sussex. *Mr. Hemmings.* Hay Crag Wood ; Eglestone and Middleton ; Teesdale Forest, Durham ; Gunnerston Crags near Barwesford ; Shewing Shields ; Cheviot, Northumberland. *Mr. Winch.* Shoreham, Sussex. *Mr. Larbalestier.* Malvern. *Dr. Holl.* Cowley Bridge road, Exeter. *Mr. Parfitt.*

SCOTLAND :—Rosslyn Wood. *Mr. Maughan.* Pentland Hills. *Dr. Greville.* Glen Dole, Clova. *Mr. Gardiner.* Beld Craig, Moffatt. *Dr. Nichol.* Killin ; Ben Lawers. *Dr. Holl.* Var. *deaurata.* Ach. (thallo magis flavescente et apotheciis majoribus) near Corriemulzie in Braemar. *Rev. J. M. Crombie.*

IRELAND :—Near Belfast. *Mr. Templeton.* near Killarney. *Dr. Taylor.* near Carnlough, co. Antrim. *Adm. Jones.*

CHANNEL ISLANDS :—Grosnez, Jersey ; Eperquerie, Sark. *Mr. Larbalestier.*

"Spores .004 to .006 in long, by .00175 to .002 in. broad." (*Mudd.*) "Spores .016—21 mm. long, .008—.011 mm. broad." (*Nyl.*).

## SUB-TRIBE II. PANNARIEI.

Thallus laciniato-radiate or squamulose or granulose, cellulose, with granula gonima. Apothecia lecanorine or biatorine. Spores 8, colourless, ellipsoid, simple or 1-septate. Sterigmata pluriarticulate.

## II. PANNARIA. *Del.*

Characters as above.

### A. *Spores simple.*

1. *P. rubiginosa,* (Thunb.) *livido-glaucescent* or pale, laciniate, laciniæ appressed, nearly plane, inciso-lobulate and crenate, *upper surface very minutely areolato-granulate, edges somewhat thickened, silvery-whitish and upturned,* under surface tomentose, cæruleo-fuscescent ; apothecia rufous, margin crenulate ; spores 8, colourless, ellipsoid, apices rather acute, simple.

On mossy rocks and trees. 1801.

SYN :—Thunberg Fl. Cap. 176. (1794.) Ach. Syn. 202. Nyl. Scand. 122. Mudd Man. 122.

FIG :—E. Bot. 983. Hepp Sporen t. 69 f. 606.

EXS :—Schær. 563. Hepp 606. Welw. Lusit. 78. 123. Maudon 15. Leight. 234.

GEOG. DISTRIB :—Europe, America.

BOT. PROV :—1, 2...5...7...10, 11, 12, 13...15...19 26...31.

ENGLAND—Keswick, Cumberland. *Mrs. Stanger.* Teesdale. Durham. *Rev. J. Harriman.* near Settle. Yorkshire. *Dr. Windsor.* Hay Coppice, Herefordshire. *Rev. T. Salwey.* Charnberry and Eglestone Woods, Durham. *Mr. Winch.* S. Devon. *Dr. Holl.* Appuldercombe, Isle of Wight. *Rev. A. Bloxam.*

SCOTLAND :—Aberfeldy. *Dr. Maingay.* Drumlanrig Wood, Dumfries. *Mr. Stevens.* Glen Dole, Clova. *Mr. Gardiner.* Killin. *Dr. Holl.* S. W. Grampians, head of Loch Awe. *Rev. J. M. Crombie.*

IRELAND :—Killarney. *Dr. Carrington.* frequent in the mountainous districts. *Mr. Carroll.* Glendalough ! Derryclare Island ! Connemara. *Mr. Larbalestier.*
WALES : – Barmouth ! Valley above Halfway House ; and above Borthwnog, *Rev. T. Salwey.*
CHANNEL ISLANDS :—Jerbourg, Guernsey. *Mr. Larbalestier.*
"Spores .0035 to .004 in. long, by .0015 to .002 in. broad." (*Mudd.*) "Spores .017—25 mm. long, .007—.010 mm. broad." (*Nyl.*)

Var. *cæruleo-badia*, (Schleich.) centre of thallus and margins *cæsio-pulverulento-sorediose.*

On trees.

SYN :—Schleicher Cent. 2. 71. (1805.) *P. conoplea*, Ach. Syn. 43. Nyl. Scand. 122. Mudd Man. 122.
FIG :—Mass. Ric. fig. 219. Hepp Sporen t. 69 f. 607.
EXS :—Schær. 369. Hepp 607. Zw. 253. Anzi It. S. 151. M. and N. 347.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...12...15...(19—26—30)...31.
ENGLAND :—Keswick, Cumberland. *Mrs. Stanger.* Oswestry, Shropshire ! *Rev. T. Salwey.*
SCOTLAND :—Tressachs. *Rev. J. M. Crombie.*
IRELAND :—On rocks not unfrequent. *Mr. Carroll.* Derryclare Island ! co. Galway. *Mr. Larbalestier.*
WALES :—Valley above Halfway House ; and above Borthwnog near Barmouth, *Rev. T. Salwey.* Dolgelley ! Glyn, near Capel Curig ! Drwsynant ! Capel Arthog ! Llyn Gwernan !
CHANNEL ISLANDS ;—Jerbourg, Guernsey ; Rozel, Jersey. *Mr. Larbalestier.*

3. *P. leucolepis*, (Whlnb.) *albo or livido-cinerascent*, squamulose, squamulæ imbricate *verrucoso-areolate in the centre*, those towards the *circumference appressed*, *radiato-lobate*, dilated, sub-crenate, slightly *longitudinally striated ;* apothecia black, plane, margin tumid, *crenulate ;* spores 8, colourless, ellipsoid, simple.

On micaceous rocks, rare. 1811.

SYN :—Wahl. Fl. Lapp. 420. Ach. Syn. 194. Nyl. Scand. 123. Mudd Man. 125.
FIG :—E. Bot. 2283.
EXS :—Leight. 267. Anzi Langob. 27.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15...26.
SCOTLAND :—Ben Lawers ! and Mael Greadha. *Mr. Borrer. Messrs. Macmillan ! Carroll ! and Jones.* Breadalbane Mountains. *Messrs. Borrer & Hooker.*
IRELAND :—Dawros river ! co. Galway. *Mr. Larbalestier.*
"Spores .003 to .004 in. long, by .00125 in. broad." *(Mudd.)* "Spores .015—17 mm. long, .009—.010—mm. broad." *(Nyl.)*

4. *P. pezizoides*, (Web.) *brown*, cervine or cinereo-fuscescent, *granulato-squamulose*, densely imbricate, squamulæ small crenate ; apothecia testaceo-rufous or rufo-fuscescent, *margin crenulate ;* spores 8, colourless, ellipsoid, simple.

On the earth amongst moss and on rocks, frequent.

SYN —Web. Spicil. 200. (1778.) *brunnea*, Ach. Syn. 193. Nyl. Scand. 123. Mudd Man. 123.
FIG :– E. Bot. Suppl. 2801.
EXS :—Fellm. 96. Schær. 160. M. and N. 639. Mass. 315. Mudd 90. Anzi It. S. 152. Fries 256.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...7...10...12...15...19...26...31.
ENGLAND :– Holwick Scar, Yorkshire. *Mr. Robertson.* Cumberland ! *Mrs. Stanger.* near Battersby ! Baysdale ! Cleveland. *Mr. Mudd.* Heavitree, Exeter. *Mr. Parfitt.* near Bonchurch, Isle of Wight. *Rev. A. Bloxam.*

SCOTLAND :—Kenmore; Ben Lawers. *Dr. Holl.* abundant in the Grampians. *Rev. J. M. Crombie.*

IRELAND :—Bantry. *Miss Hutchins.* Cromaglan. *Dr. Carrington.* Lough Inagh, Connemara (on decayed holly). *Mr. Larbalestier.* (1875.)

WALES :—Cwm Bychan near Barmouth! *Rev. T. Salwey.* Tygwyn, Dolgelley. *Dr. Holl.* Cwm Cywion!

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

"Spores .005 to .006 in. long, by 002 to .00225 in. broad." (*Mudd*). "Spores .016—27 mm. long, .007—.010 mm. broad." (*Nyl.*) Spores .023—.0235 mm. long, .011 mm. broad.

Var. *coronata*, (Ach.) *cæruleo-cinerascent*, minutely *granuloso-subpulverulent*; apothecia small, reddish-brown, *margin granulose.*

On the earth in mossy shady places, frequent. 1796.

SYN :—Ach. Syn. 194. (1817.) Nyl. Scand. 124. Mudd Man. 124.

FIG :—E. Bot. 1246.

EXS :—Larbal. 26. Leight. 235. Anzi It. S. 153.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...5...7...11, 12, 13, 14, 15...19...31.

ENGLAND :—Near High Hesket, Cumberland. *Mrs. Stanger.* Shropshire. *Rev. E. Williams.* South bank of the Derwent above Blanchland, Northumberland; Howns Wood near Lanchester and in Teesdale Forest, Durham. *Mr. Winch.* Malvern; S. Devon and Cornwall. *Dr. Holl.* Budleigh Salterton, Devon. *Dr. Dickie.*

SCOTLAND :—Dumfriesshire. *Dr. Burgess.* near Stirling. *Dr. Buchannan.* Pentland Hills. *Mr. Maughan.* Colinton. *Dr. Greville.* Killin. *Dr. Holl.* Grampians. *Rev. J. M. Crombie.*

IRELAND :—Killarney. *Dr. Carrington.* frequent in subalpine situations. *Mr. Carroll.*

WALES :—Bangor. *Mr. Turner.* Barmouth! Gwydir!

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Jersey. *Mr. Larbalestier.*

"Spores .004 in. long, by .0015 in. broad." (*Mudd.*) Spores .019—.020 mm. long, .008—.009 mm. broad.

5. *P. microphylla*, (Sw.) *cervine* or livido-cinerascent, *squamuloso-crustaceous, areolato-diffract, squamulæ* minute, crenate, closely imbricate, *whitish at the edges*, under surface nigricant; apothecia fuscous or rufescent, convex, *pale within, margin ultimately obliterated;* spores 8, colourless, ellipsoid, simple.

On trees and rocks, very rare. 1799.

SYN :—Swartz in V. Ac. H. 301. (1791.) Ach. Syn. 53. Nyl. Scand. 124. Mudd Man. 123.

FIG :—E. Bot. 1247. Hepp Sporen t. 69. f. 608.

EXS :—Zw. 388. Anzi It. S. 150. Schær. 161. Hepp 608. Larbal. 71.

GEOG. DISTRIB :—Europe, Asia, Africa, N. America.

BOT. PROV :—1...4...19...26...31.

ENGLAND :—Cornwall; Yarmouth. *Mr. Turner.*

IRELAND :—Killarney. *Dr. Moore.* Dawros river! co. Galway. *Mr. Larbalestier.*

CHANNEL ISLANDS :—Jerbourg, Guernsey; Rozel Tower, Jersey; L'Eperquerie, Sark! *Mr. Larbalestier.*

"Spores .003 to .0035 in. long, by .001 to .0015 in broad." (*Mudd.*) "Spores .010—17 mm. long, .005—1 mm. broad." (*Nyl.*) Spores .015—.016 mm. long, .007—009 mm. broad.

6. *P. triptophylla*, (Ach.) *fusco-cinerascent, squamulose, orbicular* or irregular, squamulæ membranaceous, *laciniato-lobate*, crenate, appressed or *microlepideo-granulose or coralloideo-squamulose*, compact, areolato-diffract, hypothallus cæruleo-nigricant; apothecia fuscous or rufo-fuscescent, *hypothecium fusco-nigricant, margin* pale, *persistent;* spores 8, colourless, ellipsoid, simple; gelatina hymenea blue with iodine.

On trees, rare. 1799.

SYN :—Ach. L. U. 215. (1810.) Syn. 53. Nyl. Scand. 125. Mudd Man. 123.
FIG :—E. Bot. 2128. Schrad. t. 1. f. 4. Hepp Sporen t. 69 f. 610.
EXS .—Fellm. 98. 99. Schær. 159, Hepp 610. M. & N. 552.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—1, 2...5...7...15, 16, 17...19...30.
ENGLAND :—Bodmin. *Mr. Turner.* Sussex. *Mr. Hemmings.* Pentregaer near Oswestry ! *Rev. T. Salwey.* near Lidford, S. Devon. *Dr. Holl.*
SCOTLAND :—Loch Katrine. *Mr. Turner.* Inverary ! and Glen Ach-na-shilloch, Rosshire. *Messrs. Borrer & Hooker.* Appin. *Rev. J. M. Crombie.*
IRELAND :—County of Antrim. *Dr. Taylor.* Curraghmore, Waterford, and Glengariff, Cork ; Cromaglown, Killarney. *Adm. Jones.* Turk Mountains ; and Dinis Island ; Glenbower Wood, Killeagh. *Mr. Carroll.*
WALES :—Barmouth ! *Rev. T. Salwey.* Dolgelley. *Dr. Holl.* Gwydir Woods ! Bettws-y-coed.
"Spores .003 to .004 in. long, by .00125 to .0015 in. broad." *(Mudd.)* "Spores .012—19 mm. long, .006—8 mm. broad." *(Nyl.)* Spores .017—.020 mm. long, .007—.008 mm. broad.

forma *nigricans*, (Leight.) thallus intensely *black ;* apothecia rufo-fuscescent, margin pale persistent ; spores 8, colourless, ellipsoid, simple.

On ash trees, rare. 1876.

BOT. PROV :—7.
WALES :—Llyn Gwernan ! (1876.)
Spores .0235 mm long, .0095 mm. broad.

7. *P. lasiella*, (Stirt.) dark or *nigricanti-virescent, microlepideo-squamulose* or *minutely coralloideo-granulose*, thickish ; hypothallus black, thick, spongioso-context, with radicles ; *apothecia black, lecideine* or *sometimes darkly rufous, round or flexuose, innato-sessile*, plane, acutely margined ; *spores colourless, ellipsoid or fusiformi-ellipsoid, simple, epispores somewhat crenulate ;* paraphyses distinct, articulate, the black apices conglutinate ; *hypothecium fuscescent* or in a thickish section fuscous or fuscous-black.

On Hepaticæ (Frullaniæ), rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. 164. (1877.)
BOT. PROV :—17.
SCOTLAND :—Near Garve. *Dr. Stirton.* (1877.)
"Spores .014—.018 mm. long, .007—.009 mm. broad. Gelatina hymenea I blue, then vinous-red or vinous-fulvescent. Intermediate between *P. triptophylla* and *P. nigra*, but nearer the former." *(Stirt.)*

8. *P. nebulosa*, (Hffm.) *cinereous or darkly cæsio-cinerascent, granulato-crustose*, granules thin, imbricato-congested, crenate, forming a thin crust ; *apothecia biatorine*, rufous or rufo-fuscescent, small, plane or slightly convex and crowned with the thallus ; spores 8, colourless, ellipsoid or oblong, simple.

On the earth, very rare. 1869.

SYN :—Hffm. Fl. Germ. 166. (1795.) Nyl. Scand. 125.
EXS :—Nyl. 114.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15...31.
SCOTLAND :—Killin. *Rev. J. M. Crombie.*
CHANNEL ISLANDS :—Trinity and Quenvais, Jersey. *Mr. Larbalestier.*
"Spores .015—24 mm. long, .006—9 mm. broad." *(Nyl.)*

f. *coronata*, (Flk.) apothecia lecanoroid, crowned with a granulose thalline margin, spores ellipsoid.

On the earth, rare. 1876.

SYN :—Nyl. Scand. 125.
EXS :—Flk. D. L. 151.
GEOG. DISTRIB :—Europe.
BOT. PROV :—26.
IRELAND :—South side Killery Bay ! Lettermore ! Galway. *Mr. Larbalestier.* (1876.)
Spores .027. mm. long, .011 mm. broad.

9. *P. plumbea*, (Lightf.) livido-cinerascent, submonophyllous, orbicular, adnate, frequently granuloso-rugose in the centre, radiato-incised, *laciniæ longtitudinally radiato-plicato-rugose or striated, concentrically arcuato-rugulose* towards the margins, which are broadly expanded and crenate, *hypothallus dark, plumbeo-cærulescent, tomentoso-filamentose ;* apothecia reddish-brown, plane, margin paler, entire ; spores 8, colourless, ellipsoid, simple.

On trees, rare. 1777.

SYN : -Lightfoot Fl. Scot. 2. 826. (1777.) Ach. Syn. 202. *Coccocarpia*, Nyl. Scand. 128. Mudd Man. 121.
FIG :—Lightfoot Fl. Scot. t. 26.
EXS :—M. & N. 939. Maudon 14. Schær. 564. Larbal. 72. Leight. 233.
GEOG. DISTRIB :—Europe, N. Africa.
BOT. PROV :—1, 2...6, 7...11, 12, 13...15...19, 20...26...31.
ENGLAND :—Keswick ! Cumberland. *Mrs. Stanger.* near Eglestone, Durham. *Rev. J. Harriman.* Sussex. *Mr. J. Hemmings.* near Bodmin and Liskeard. *Messrs. Turner and Sowerby.* Healey-field and Middleton-in-Teesdale, Durham. *Mr. Winch.* S. Devon and Cornwall. *Dr. Holl.* Appuldercombe, Isle of Wight. *Rev. A. Bloxam.*
SCOTLAND :—Fall of Foyers, Caledonian Canal ; Glen Nevis, Lochaber ; Loch-Lomond between Tarbet and Arrochar ! *Dr. Lindsay.* Drumlanrig ; Barntimperm Linn, Moffatt. *Dr. Burgess.* Birks of Aberfeldy. *Mr. Macmillan.* Glen Falloch ; Killin. *Dr. Holl.* Grampians. *Rev. J. M. Crombie.*
IRELAND :—Killarney ; Gougaunebarra ; Cork ; &c. *Mr. Carroll.* Mucross ; Killarney. *Dr. Carrington.* Derryclare Island ! co. Galway. *Mr. Larbalestier.*
WALES :—Near Beaumaris ! *Rev. A. Bloxam.* Cardiganshire. *Sir J. E. Smith.* Gwydir Woods ! Bettws-y-coed !
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* Alderney ; La Coupe, Jersey ; Crévichou ! *Mr. Larbalestier.*
" Spores .003 to .004 in. long, by .001 to .00125 in. broad." *(Mudd.)* " Spores .014—22 mm. long, .007—9 .mm broad. (*Nyl.*)

f. *myriocarpa*, (Del.) centre of thallus granuloso-rugose or microphylline.

On trees, frequent.

SYN :—Nyl. Scand. 128.
EXS :—Crombie 57. Desmaz. Cr. Fr. ed. 1. 1938, ed. 2. 1588. Larb. 72. Maud. 14. Anzi Etr. 11.
BOT. PROV :—7...31.
WALES :—Beaumaris ! *Rev. A. Bloxam.*
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

B. *Spores* 1-*septate.*

10. *P. nigra*, (Huds.) *dark cinereo-nigricant or fuscous-black or black*, minutely and densely *coralloideo-granuloso-crustaceous, diffracto-areolate*, bounded by an expanded distinct bluish-black *byssoid hypothallus ;* apothecia *black*, plane or slightly convex, margin entire, concolorous, *hypothecium nigro-fuscous ;* spores 8, colourless, ellipsoid, 1-septate, cells nucleolate.

On calcareous rocks. 1778.

SYN :—Hudson Fl. Angl. ed. 2. 524. (1778) Nyl. Scand. 126. *Collema*, Ach. Syn. 308.

FIG :—E. Bot. 1161. Nyl. Scand. fig. 2. b.
EXS :—Schær. 226. Mass. 354. Mudd 144. Anzi It. S. 9. Hepp 9.
GEOG. DISTRIB :—Europe, Africa, N. America, New Zealand.
BOT. PROV :—1, 2...5...7, 8...10, 11...15...26 ..28.. 30, 31.
ENGLAND :—St. Ives, Cornwall. *Mr. Hudson.* Kirkby Lonsdale, Westmoreland. *Sir J. E. Smith.* Durham. *Rev. J. Harriman.* Worthing, Sussex ; Oswestry ! *Rev. T. Salwey.* Bridge near Upton on-Severn. *Mr. E. Lees.* Bilsdale ! Rivaulx ; near Yarm ; near Stanhope, Durham. *Mr. Mudd.* Ingleborough. *Dr. Carrington.* Hudshead ; Old Castle, Berwick-on-Tweed. *Dr. Johnston.* Cleadon and Boldon Hills ; Gateshead Fell and near Eglestone, Durham. Scotswood and Heaton Denes, and Heddon-on-Walls, Northumberland. *Mr. Winch.* Malvern ; S. Devon ; Derbyshire. *Dr. Holl.* Exmouth, Torquay. *Mr. Piggott.* Edgock, Worcestershire ; Oversley Bridge, Warwickshire. *Mr. Purton.* Guestling, Sussex ; Bury, Suffolk. *Rev. E. N. Bloomfield.* Old Eastbourne. *Mr. Roper.* Llanyblodwel rocks ! Norton Camp ! High Rock near Bridgnorth ! Shropshire ; Breedon Hill ! Leicestershire ; Llanymynech Hill !
SCOTLAND :—Ben Lawers. *Dr. Holl.* Crombie En. 43. mentions a var. *triseptata*, Nyl. sporis 3-septatis, as occurring in Appin.
IRELAND :—Armagh. *Adm. Jones.* near Belfast. *Mr. Templeton.* common on limestone rocks. *Mr. Carroll.* Glamorbol ! *Mr. Larbalestier.*
WALES :—Denbighshire. *Mr. Griffith.* Eglwyseg rocks !
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .011—16 mm. long, .005—7 mm. broad." (*Nyl.*) Spores .0125 –.0155 mm. long, .0055—.006 mm. broad.

11. *P. cheilea*, (Nyl.) *greyish or olive-brown, squamulose*, squamulæ *cartilaginous*, minute, rounded and *turgid*, dilated, *inciso-lobate*, crenate, crowded, imbricate, crustaceous, diffracto-areolate, *hypothallus fusco-nigricant ;* apothecia *subinnato-sessile, fuscescent*, plano-convex, margin thin, entire or crenate ; spores 8, colourless, elliptico-oblong or ovate, 1-septate.

On moist shady maritime rocks, rare. 1860.

SYN :—Nyl. in Mudd Man. Br. Lich. 126. (1861).
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...24...29.
IRELAND :—Stroove Head, Donegal. *Prof. Dickie.* Blackwater Bridge ; Kilkee, Clare ; Western Blasquet Island, Kerry ! *Mr. Carroll.*
"Spores .004 to .005 in. long, by .00125 to .00225 in. broad." (*Mudd.*)

12. *P. carnosa*, (Dicks.) *livido-fuscescent or cervino-fuscescent, squamuloso-lobate*, lobes variously divided or crenato-incised, *margins thickened granoso-crenate*, imbricate or adscendenti-congested, *whitish beneath ; apothecia fuscous or fusco-rufescent*, margin paler ; spores 8, colourless, oblongo-fusiform or ellipsoid, 1-septate.

On mosses in sub-alpine localities. 1790.

SYN :—Dicks. Crypt. Br. 2. 21. (1790.) *muscorum*, Ach. Syn. 193. Nyl. Scand. 127. Mudd Man. 126.
FIG :—Dicks. Cr. Br. 2. t. 6. f. 7. E. Bot. 1684.
EXS :—Fries 44. Anzi Langob. 86. 87. Schær. 482.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5...7...11, 12...15, 16...19...23...26.
ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.* S. Brent, Devon. *Dr. Holl.* Didworthy, Devon. *Rev. J. M. Crombie.* Castleton rocks ! Cumberland. *Mrs. Stanger.* Oswestry ! *Rev. T. Salwey.* Hag Crag wood in Teesdale Forest, Durham. *Mr. Winch.*
SCOTLAND :—Highlands. *Mr. Dickson.* abundantly in a ravine at foot of Ben More, Perthshire ; Loch Awe in Argyle ; Glen Ey ; Ben Lawers ! *Rev. J. M. Crombie.*
IRELAND :—Dublin Mountains. *Adm. Jones.* Askew Wood ; Killarney. *Dr. Taylor.* Maam Turk Mountain. *Mr. Larbalestier.*
WALES :—Denbighshire. *Mr. Griffith.* Cwm Bychan ; Rhinog Fach near Barmouth. *Rev. T. Salwey.* Dolgelley. *Dr. Holl.* Dolgelley ! *Mr. Phillips.* Cwm Ffynnon lloer !

"Spores .005 to .007 in. long, by .0025 to .00175 in. broad. t. 2. f. 39." (*Mudd.*) "Spores .016—.31 mm. long, .005—.8 mm. broad." (*Nyl.*) Spores .024 mm. long, .006 mm. broad.

Var. *determinata*, (Nyl.) *microphylline*, sub-effuse, margin of apothecia reddish-yellow; spores pale, *fuscescent*, 1-*septate*.

On moist earth. 1860.

Syn :—Nyl. Lich. Scand. 128. (1861.)
Geog. Distrib :—Scandinavia.
Bot. Prov :—22. 23...30.
England :—Dublin Mountains; Luggelaw co. Wicklow; Carnlough co. Antrim. *Adm. Jones.*

### C. *Spores 3-septate.*

13. *P. pastina*, (Ach.) Similar to *P. nigra*; apothecia internally whitish; hypothecium somewhat fuscescent; spores 8, colourless, ellipsoid, 3-septate, septa slender.

On calcareous stones. 1872.

Syn :—*P. nigra f. pastina*, (Ach. Herb.) Nyl. Scand. 126. (1861.) Crombie in Journ. Bot. n. s. 2. 133. Nyl. in Flora 1876. p. 239.
Geog. Distrib :—Scandinavia.
Bot. Prov :—2...11.
England :—On bridge over the Tay at Hexham, Northumberland. *Rev. J. M. Crombie.* (1872). Eastbourne! *Mr. Roper.*

## Sub-tribe III. AMPHILOMEI.

Thallus monophyllo-lobato, submembranaceous, soft, pulverulent, containing granula gonima. Apothecia scutelliform, thallodally margined.

## III. AMPHILOMA, *(Fr. pr. p.) Nyl.*

Characters as above.

1. *A. lanuginosum*, (Ach.) *whitish or albo-fuscescent*, adnate, lobato-dilated, lobes subimbricate, margins rotundato-crenate, *granuloso-pulverulent*, hypothallus tomentose, cærulescenti-nigricant; apothecia unknown.

On shaded mossy rocks, frequent. 1790.

Syn :—Ach. Prodr. 120. (1798.) Syn. 201. Nyl. Scand. 129. Mudd Man. 126.
Fig :—Dicks. Cr. Br. t. 6. f. 1.
Exs :—Nyl. 37. Schær. 378. M. & N. 446. Anzi It. S. 149. Leight. 55. Stenh. 123. Reich. and Schub. 25. Rabh. 854.
Geog. Distrib :—Europe, N. Zealand.
Bot. Prov :—5...7, 8...10, 11, 12...15...(19...30)...31.
England :—Keswick! Cumberland. *Mrs. Stanger.* Craigforda! near Oswestry. *Rev. T. Salwey.* Broughton Bank! near Frosterley; Falcon Clints, Durham; Kildale. *Mr. Mudd.* Bolton. *Dr. Carrington.* Malvern Hills. *Dr. Holl.* Bardon Hill; Charnwood Forest. Leicestershire. *Rev. A. Bloxam.* Llanymynech Hill! Haughmond Hill! Stiperstones! Sharpstones! &c., Shropshire.
Scotland :—Trossachs; Craig Cluny, Braemar, Lochaber. *Rev. J. M. Crombie.*
Ireland :—On moist mossy rocks not uncommon. *Mr. Carroll.*
Wales :—Dolgelley! Trefriw!
Channel Islands :—Guernsey. *Rev. T. Salwey.* Boulay Bay, Jersey. *Mr. Larbalestier.*

## SUB-TRIBE IV. SQUAMARIEI.

Thallus radioso-laciniate or cartilagineo-squamose, often radiate. Apothecia lecanorine. Spores colourless, ellipsoid, simple. Paraphyses distinct. Spermatia aciculari-cylindrical, long, arcuate.

## IV. SQUAMARIA. DC.

Characters as above.

1. *S. crassa*, (Huds.) pale yellow or whitish-green, *squamoso-imbricate*, squamæ cartilaginous, *imbricated*, *lobato-crenate*, *more or less depressed*, under surface *brown;* apothecia testaceo-rufous, plane, margin entire ; spores 8, colourless, ellipsoid, simple.

On earth in limestone regions, frequent. 1741.

SYN :—Hudson Fl. Angl. 2nd. ed. 530. (1778.) Ach. Syn. 190. Nyl. Scand. 130. Mudd Man. 127.

FIG :—E. Bot. 1893. Hepp Sporen t. 70. f. 616. Sturm Fl. D. t. 9.

EXS :—Mass. 72. 73. 74. M. & N. 1051. Nyl. L. P. 116. Mudd 91. Bohl. 2. Anzi It. S. 155. Rabh. 739. Hepp 616. Schær. 343. Arn. 2. Larbal. 73. Leight. 5.

GEOG. DISTRIB :—Europe. Africa, Australasia.

BOT. PROV :—1, 2...5...7, 8...10, 11...14...23...27 ..31.

ENGLAND :—St. Vincent's rocks, Bristol, *Sir J. E. Smith.* Durdham Down ; Bristol! *Mr. Mudd.* Oswestry! Shropshire. *Rev. T. Salwey.* Eglestone, Durham. *Rev. J. Harriman.* Wensleydale, Yorkshire. *Mr. Brunton.* Hurstpierpoint, Sussex. *Mr. Hemmings.* near Settle. *Dr. Windsor.* Malham, Yorkshire ; Westmoreland. *Mr. Hudson.* Marble Stone near Middleton-in-Teesdale, Durham. *Mr. Winch.* near Torquay; near Buxton. *Dr. Holl.* Berry Head; Croyd Bay, N. Devon. *Mr. Parfitt.*

SCOTLAND :—King's Park, Edinburgh. *Rev. J. Lightfoot.* Pentland Hills. *Dr. Greville.*

IRELAND :—Mornington co. Meath ; Skerries near Dublin ! *Dr. Moore.* near Dublin. *Mr. Carroll.* Ben Bulben, Sligo. *Prof. Dickie.*

WALES :—Puffin Island near Beaumaris. *Rev. A. Bloxam.* Holywell! Flintshire. *Prof. Churchill Babington.* Llanddwyn rocks near Newborough, Anglesea; Glyders. *Dillenius.* (1741.) Great Orme's Head ! Eglwyseg rocks !

CHANNEL ISLANDS :—Quenvais, Jersey; Coast of Herm! *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

"Spores .0025 to .003 in. long, by .001 in. broad." *(Mudd.)* "Spores .011—14 mm. long, .005–6 mm. broad." (*Nyl. & T. M. Fr.*)

2. *S. lentigera*, (Web.) pale yellowish or greenish-white, *orbicular*, *appressed*, *areolato-squamose in the centre*, *radiato-lobate at the circumference*, rotundato-undulato-crenate, *margin thickened*, *upturned*, *albo-pulverulent*, under surface *white;* apothecia pallido-testaceous, margin entire ; spores 8, colourless, ellipsoid, simple.

On chalky earth, rare. 1785.

SYN :—Weber Spicil. 192. (1778.) Ach. Syn. 179. Nyl. Scand. 130. Mudd Man. 128.

FIG :—E. Bot. 871. Web. Spicil. t. 3. Relh. Cant. t. 7. Hepp t. 20. f. 179.

EXS :—Hepp 179. M. & N. 68. Schær. 484. Anzi It. S. 154. Dicks. 23. Mass. 91. Maudon 51.

GEOG. DISTRIB :—Europe, Africa.

BOT. PROV :—2...4, 5...16.

ENGLAND :—Gogmagog Hills ! Newmarket Heath, Cambridge. *Rev. R. Relhan.* (1785). near Newhaven, Sussex. *Mr. Hemmings.* Hord's Park near Bridgnorth, Salop. *Mr. Purton.*

SCOTLAND :—Ben Brecht, Argyleshire. *Mr. Paterson.*

"Spores .0025 to .003 in. long, by .001 in. broad, t 2. f. 40." (*Mudd.*) "Spores .012 mm. long, .005 mm. broad." (*Nyl.*) "Spores .011—12 mm. long, .005 mm. broad." (*T. M. Fr.*)

3. *S. chrysoleuca*, (Sm.) *ochroleucous or whitish-strawcolour*, lobato-squamose, squamæ firm, imbricate, various in the circumference, lobate plane, crenate or crenato-incised, under surface pale, *towards the circumference broadly-nigricant, peltato-affixed ; apothecia reddish-flesh-colour*, moderate, generally crowded ; spores 8, colourless, ellipsoid, simple.

On alpine rocks, rare. 1874.

SYN :—Smith in Linn. Trans. 1. p. 82. (1791.) Ach. Syn. 189. Nyl. Scand. 131.
FIG :—Hepp Sporen t. 20. f. 176. Linn. Trans. l. c. t. 4, f. 2.
EXS :—Reich. & Schub. 36. Anzi It. S. 157. 158. Hepp 176.
GEOG. DISTRIB :—France, Pyrenees, Norway, Lapland, Sweden, Italy, E. Indies.
BOT. PROV :—16.
SCOTLAND :—Ben Brecht, Argyleshire. *Mr. Paterson*. (1874.)
"Spores .009—.011 mm. long, .005—6 mm. broad." (*Nyl. & T. M. Fr.*)

4. *S. cartilaginea*, (Westr.) *cinereo-virescent or albido-stramineous, opake*, cartilaginous, *imbricate, multifido-laciniate, laciniæ linear, sinuato-flexuose*, crenate, under surface whitish ; apothecia carneo-testaceous, or fulvo-testaceous, plane, *irregularly lobate*, margin *pale, persistent*, inflexed, entire ; spores 8, colourless, ellipsoid, simple.

On maritime rocks, rare. 1800.

SYN :—Westring in Nov. Act. Stockh. 307. (1791.) Ach. Syn. 191. Nyl. Scand. 132. Mudd Man. 128.
FIG :—E. Bot. Suppl. 2802. Hepp Sporen t. 8. f. 59.
EXS :—Zw. 188. Hepp 59. M & N. 1050.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...10.
ENGLAND :—Yorkshire. *Mr. Alexander*. (1800).
WALES :—On rocks on the shore near outlet of Llyn Bodlyn, above Barmouth ! *Rev. T. Salwey*.
"Spores .002 to .004 in. long, by .001 to .00125 in. broad." (*Mudd.*) "Spores .011—16 mm. long, .005—6 mm. broad." (*Nyl. & T. M. Fr.*)

5. *S. saxicola*, (Poll.) *ochroleucous* or pallido-sulphureo-virescent, cartilaginous, *orbicular*, appressed, *areolato-imbricato-crustaceous at the centre, radiato-lobate* towards the *circumference*, lobes *contiguous*, plane or *subplicate*, smooth, crenate ; apothecia pallido-testaceous, or testaceo-rufescent, plane, margin entire or crenulate ; spores 8, colourless, ellipsoid, simple.

On rocks, not unfrequent. 1785.

SYN :—Pollich Pal. El. 3. 225. (1777.) Ach. Syn. 180. Nyl. Scand. 133. Mudd Man. 129.
FIG :—E. Bot. 1695. Hffm. Pl. L. t. 16. 1. Mass. Ric. f. 36.
EXS :—Anzi It. S. 159. 160. Schær. 332. M. & N. 67. 67. Bohl. 55. Mudd 92. Fries 163. Nyl. Pyr. or. 29. Reich. & Schub. 10. Leight. 145.
GEOG. DISTRIB :—Throughout the world.
BOT. PROV :—1...3, 4, 5...7, 8...10, 11...15...(19—26—30)...31.
ENGLAND :—Cambridge. *Rev. R. Relhan*. Oxford. *Dr. Sibthorp*. Cliffrigg ! Cleveland. *Mr. Mudd*. Gunnerton Crags near Barnesford ; near Warden Mill ; Carham and Wark by the Tweed, Northumberland ; near Urpeth ; Cawsey Hall ; near Eglestone and Gainford. Durham. *Mr Winch*. Kelvedon, Essex. *Mr. Varenne*. Bedfordshire. *Rev. C. Abbot*. Twycross Church, Leicestershire. *Rev. A. Bloxam*. Midland Counties. *Mr. Purton*. Malvern Hills. *Rev. W. S. Rufford*. Devon. *Messrs. Jones & Kingston*, Lyth Hill ! Middle ! Bodbury Ring ! Haughmond Hill ! Caer Caradoc ! Shropshire.
SCOTLAND :—Clova ; Reeky Linn ; near Brechin ; Balbeuchly ; Broughty Castle ; Hare Craigs ; Ninewells ; Paddock Stane near Invergowrie. *Mr. Gardiner*.

IRELAND :—On rocks, not unfrequent. *Mr. Carroll.* near Belfast. *Mr. Templeton.* Kerry. *Dr. Taylor.* Lough Inagh. *Mr Larbalestier.*
WALES :—Llyn Geirionydd ! Dolgelley ! Diganwy ! near Conway.
CHANNEL ISLANDS ;—Guernsey. *Rev. T. Salwey.* Jersey. *Mr. Larbalestier.*
"Spores .0025 in. long, by .001 in. broad." (*Mudd.*) "Spores .010—16 mm. long, .006—7 mm. broad." (*Nyl.*) "Spores .009—15 mm. long, .005—7 mm. broad." (*T. M. Fr.*)

Var. *diffracta*, (Ach.) *areolato-diffract*, areolæ contiguous, angular, *nigro-marginate.*

On rocks.

SYN :—Ach. L. U. 432. (1810.) Syn. 180. Nyl. Scand. 133. Mudd Man. 129
EXS :—Leight. 81. Mudd 93. Mass. 360. Anzi Langob. 269.
GEOG. DISTRIB :—Europe.
BOT. PROV —5...7...19...15.
ENGLAND :—Cliff-Rigg ! near Ayton ! Lanbraugh Rigg ! Cleveland. *Mr. Mudd.* Haughmond Hill ! Shropshire.
SCOTLAND :—Monument Hill, Perth ! Abernethy ! Ben Lawers ! *Dr. Lindsay.* Craig Guie in Braemar. *Rev. J. M. Crombie.*
WALES :—Criccieth Castle !

Var. *versicolor*, (Pers.) *albo-flavescent*, more or less *albo-suffused*, the upper surface of laciniæ towards the circumference *minutely albo-depresso-granulate*, margin of apothecia entire, often albo-pulverulent.

On rocks and moss. 1856.

SYN :—Pers. in Ust. N. Ann. Bot. st. 7. p. 24. (1794.) Ach. Syn. 184. Nyl. Scand. 133.
FIG ;—Hepp Sporen t. 102. f. 899.
EXS :—Anzi Venet. 30. It. S. 161. Langob. 41. Hepp 899.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5, 6, 7...15.
ENGLAND :—On roof tiles, Basingstoke ! Hants ! *Mr. Rob. Southey Hill.* (1856).
SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*
WALES :—Llyn Geirionydd ! St. David's ! Pembrokeshire. Castel Diganwy ! near Conway. Barmouth ! Llanymynech Hill !

Var. *albo-marginata*, (Nyl.) margins white.

On decayed mosses on walls.

SYN :—Nyl. in Sallsk. pro. F. et H. F. Not. xi. p. 181.
ENGLAND ;—Near Lewes, Sussex. *Rev. J. M. Crombie.*

Forma *dispersa*, (Leight.) *albo-pulverulent*, in *scattered*, distant, *round*, *tumid*, *convex*, *minute masses*, in which the minute *apothecia* are *crowded and imbedded.*

On calcareous rocks, rare. 1874.

WALES :—Great Orme's Head ! (1874).

6. *S. gelida*, (L.) *dirty creamy-white*, smooth, crustaceous, *closely adnate*, *orbiculari-radiose*, plane, *areolato-diffract* in the centre, *radiato-laciniate* at the circumference, truncato-crenate, with central carneo-cinerascent depresso-verrucaroid *radioso-rimose cephalodia ;* apothecia pale reddish, margin tumid entire ; spores 8, colourless, ellipsoid, simple.

On alpine rocks, frequent. 1782.

SYN :—Linn. Mant. 2. 133. (1771). Ach. Syn. 186. Nyl. Scand. 134. Mudd Man. 129.
FIG :—E. Bot. 692. Hepp Sporen t. 89. f. 773.
EXS :—Hepp 773. Th. M. Fr. 31. Arn. 430.
GEOG. DISTRIB :—Norway, W. Finland, W. France, N Zealand.
BOT. PROV :—1...5...7...11, 12...15...17, 18, 19...26...30.

ENGLAND:—High Force, Holwick, and Cronkley Fell, Teesdale. *Rev. J. Harriman.* Buttermere. *Mrs. Stanger.* Ambleside. *Mr. Hailstone.* Winch Bridge; Cauldron Snout; Charnberry near Eglestone, and in Teesdale Forest, Durham. *Mr. Winch.* Bridford, Devon. *Messrs. Jones and Kingston.* Stiperstones Hill! Long Mynd! Shropshire.

SCOTLAND:—Glen of Leney near Stirling. *Dr. F. Buchannan.* (1782.) Fort Augustus, Caledonian Canal! Ben Nevis! Quiraing, Isle of Skye! *Dr. Lindsay.* Ben Lawers. *Dr. Maingay.* Clova; Linn of Dee, Aberdeenshire. *Mr. Gardiner.* Kenmore. *Dr. Holl.* Breadalbane & Braemar. *Rev. J. M. Crombie.*

IRELAND:—Connor Cliffs Dingle! Blase of Cahar, Mc Gillicuddy's rocks; Pass of Keim-an-Eigh. *Mr. Carroll.* Dunkerron Mountain. *Dr. Taylor.* Glengariff; Carnlough co. Antrim. *Adm. Jones.* Coast of Antrim. *Dr. Moore.* Lough Muck! Letterfrack and Salrock, co. Galway. *Mr. Larbalestier.*

WALES:—Near Gwastadannas; Arthog; Llyn Bodlyn. *Rev. T. Salwey.* Cader Idris! Cwm Cywion! Aran Mowddy! Moel-y-gest! near Tremadoc.

"Spores .003 in. long, by .0015 in. broad." (*Mudd.*) "Spores .014—18 mm. long, .006—8 mm. broad." (*Nyl. & T. M. Fr.*)

f. *dispersa*, (Cromb.) thallus diffract, scattered.

On walls, Craig Tulloch, very sparingly. *Rev. J. M. Crombie.* (1870). Moel-y-gest! near Tremadoc.

## SUBTRIBE V. PLACODEI.

Thallus radiate or laciniato-radiate. Apothecia lecanorine or sub-biatorine. Spores 8, colourless, ellipsoid, polari-bilocular, rarely simple or 1-septate. Paraphyses distinct. Sterigmata articulate. Spermatia slender, shortly cylindrical.

## V. PLACODIUM, *DC. Nyl.*

Characters as above.

### A. *Thallus flavescent.*

1. *P. murorum*, (Hffm.) bright yellow, orbiculari-radiate, adnate, rimoso-areolate or rimoso-squamulose and whitish in the centre, *plicato-laciniate at the circumference, laciniæ narrow, convex, incurved and subcrenate at the apices, very minutely granulato-scabrous on the upper surface;* apothecia *dusky orange-coloured, disk minutely granulate*, margin entire; spores 8, colourless, *ellipsoid*, polari-bilocular; K red or purple.

On walls, rocks, &c. frequent.

SYN:—Hffm. Enum. 63. (1784.) Ach. Syn. 181. Nyl. Scand. 136. Mudd Man. a. 132.

FIG:—Hffm. En. t. 9. f. 2. Pl. L. t. 17. f. 3. Hepp Sporen t. 22. f. 196.

EXS:—Hepp 196. Nyl. 119. Mass. 93. in part. Mudd 94. Zw. 58. Leight. 113.

GEOG. DISTRIB:—Throughout the world.

BOT. PROV:—1, 2, 3, 4, 5, 6 ..10, 11...(19—30)...31.

ENGLAND:—Bilsdale! Black Hall rocks near Hartlepool! *Mr. Mudd.* near Gainford, Durham, and coast of Northumberland. *Mr. Winch.* Kelvedon; Mistley, Essex. *Mr. Varenne.* Exeter. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Guestling, Sussex, and Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Swinnop. East Allendale, Northumberland. *Rev. W. Johnson.* Saltwood Castle, near Hythe. *Mr. Holmes.* Moreton; Gidleigh; Ilsington; Inwardleigh; Tor Abbey; Babbicombe, Devon. *Messrs. Jones and Kingston.* near Yarmouth. *Mr. D. Turner.*

SCOTLAND:—Forfar. *Mr. Croall.* frequent in lowlands and maritime districts. *Rev. J. M. Crombie.*

IRELAND:—Walls and rocks, common. *Mr. Carroll.*

WALES:—Caswell Bay! Mumbles.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.* common on all the Islands. *Mr. Larbalestier.*

"Spores .002 to .00125 in long, by .00125 to .0015. in. broad." (*Mudd.*) "Spores .011– 14 mm. long, 007—8 mm. broad." (*Nyl.*) "Spores .011– 16 mm. long, .004—7 mm. broad." (*T. M. Fr.*)

Forma *lobulatum*, (Smrft) *vitellinous*, sub-effuso-areolate, almost *obliterated*, sub-effigurate or crenato-lobulate ; *apothecia* numerous and *crowded*. K red or purple.

On rocks.

SYN :—Smrft. Lapp. 87. (1826) Nyl. Scand. 136. Mudd Man. 123.
FIG :—Hepp Sporen t. 9. f. 71.
EXS :—Lindig 162. Mudd 95. Hepp 71. Anzi Langob. 275. Leight. 207. Larbal. 74.
GEOG. DISTRIB :—Europe, Asia, Africa, America.
BOT. PROV :—1. .6, 7,... 10...15...19...26...80...31.
ENGLAND :—Ayton ! Yorkshire. *Mr. Mudd.* Torquay. *Dr. Holl.* N. Devon. *Mr. Parfitt.*
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Coast of Antrim, *Dr. Moore.* Black rock, Cork. *Mr. Carroll.* Kylemore ! co. Galway. *Mr. Larbalestier.*
WALES :—Southerndown ; Glamorgan. *Dr. Holl.* Llyn Aran ! Cader Idris ! Rhyll ! Gimlet Rock! Pwllheli. Y Fegle- fawr ! near Barmouth. Caswell Bay ! Mumbles.
CHANNEL ISLANDS :—Coast of Guernsey, Jersey, Sark, Herm, Jethou ! *Mr. Larbalestier.*

"Spores .0025 in. long, by .001 in. broad." (*Mudd.*) Spores .012 –.0135 mm. long, .005—6 mm. broad.

Forma *dissidens*, Nyl. laciniæ of thallus *much more separated* and freer, very minutely granulato-scabrous on the upper surface. Spores .009—16 mm. long, .009—16 mm. broad.

On argillaceo-schistose rocks.

SYN:—Nyl. in Flora 1875. p. 298.
ENGLAND :—Near Cirencester ! *Mr. Joshua.*

2. *P. cirrhochroum*, (Ach.) *aurantiaco-vitellinous*, orbicular, centrifugo-laciniate, *laciniæ very narrow, linear, parallel, convex, incurved* and entire, subincised or sublobulate at the *apices* which are slightly *albo-pruinose* or *granulato-scabrous, efflorescent in the centre into golden soredia ;* apothecia very rare, minute, scattered, plane, orange-coloured ; margin elevated, nearly entire ; spores 8, colourless, oblong, polari-bilocular, minute.

On limestone rocks, rare. 1871.

SYN :—*Lecanora*, Ach. Syn. 181. *Placodium*, Nyl. Scand. 137. *Amphiloma*, Kbr. Par. 49.
EXS :—Schær. 480. Arn. 160. Anzi Langob. 31. 316.
GEOG. DISTRIB :—Switzerland, Germany, Italy.
BOT. PROV. :—1...12.
ENGLAND :—Near Arnbarrow and Milnthorp ! Levens Park ! Westmoreland ! *Mr. Martindale.* (1871.) Brancombe Cliff ! Leaton, Devon. *Mr. Holmes.*

"Spores .013—18 mm. long, .005—6 mm. broad." (*T. M. Fr.*)

3. *P. decipiens*, (Arn.) *pale dirty vitellinous-yellow, opake*, thin, crustaceous, *orbiculari-radiate*, adnate, *plicato-laciniate at the circumference*, laciniæ narrow, convex, incurved and sub-crenate at the apices, *verrucoso-areolate in the centre*, conspicuously *granuloso-scabrous*, almost leprose, on the upper surface of the thallus and on the thalline margin of the apothecia ; apothecia concolorous, sunk, plane, waxy ; spores 8, colourless, ellipsoid, polari-bilocular.

On calcareous rocks, rare. 1871.

SYN :—Arnold in Flora 1866. p. 530.
EXS :—Arn. 382. a. and b.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3, 4, 5...7.
ENGLAND :—Framlingham Castle ! Herringfleet ! *Mr. D. Turner.* Kemble ! Wilts. Pimbury Park ! Cirencester. *Mr. Joshua.* Saltwood Castle near Hythe. *Mr. Holmes.* Weston ! Oxfordshire. *Mr. Larbalestier.* Whitburn, Durham. *Rev. W. Johnson.* Llanymynech Hill ! Shropshire. (1871).
WALES :—Rhyddlan Castle !

4. *P. miniatum*, (Hffm.) *miniato-fulvescent*, radiate at the circumference, minutely *punctellato-impressed ;* apothecia still deeper coloured.

On rocks, &c. 1794.

SYN :—Hffm. Pl. L. 3. 16. (1801.) Ach. Syn. 182. Nyl. Scand. 136. Mudd Man. 132.
FIG :—Hffm. Pl. L. t. 60. f. 1. Hepp Sporen t. 22. f. 195. & 906.
EXS :—Anzi Langob. 29. 274. Hepp 195. 906. M. & N. 354. Mass. 104. Schær. 545. 338. right hand spec. Anzi It. S. 133. a.
GEOG. DISTRIB :—Throughout the World.
BOT. PROV :—5...8...11...18, 19...31.
ENGLAND :—Oswestry, Shropshire. *Rev. T. Salwey.* on Gainsford Church, Durham. *Rev. J. Harriman.* Derbyshire. *Sir J. E. Smith.* Llanymynech Hill ! Shropshire.
SCOTLAND :—*Sir J. E. Smith.* (1794.) Stennis, Orkney. *Dr Lindsay.*
IRELAND :—Blackwater Hill ; Dunkerron. *Dr. Taylor.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

Forma *obliteratum*, (Pers.) *miniato-fulvescent*, *sub-effuso-areolate*, almost *obliterated*, sub-effigurate or crenato-lobulate ; *apothecia* crowded, *concolorous*, margin entire.

On rocks, frequent.

SYN :—Pers. in Ust. Ann. Bot. 11. p. 15. (1794.) Ach. Syn. 182. Nyl. Scand. 136.
EXS :—Leight. 268. Anzi Langob. 29. 274.
GEOG. DISTRIB :—Throughout the World.
BOT. PROV :—6, 7.
WALES :—Barmouth ! North Cliff ! Tenby.
"Spores .010—12 mm. long, .0045—.055 mm. broad." *(Nyl.)*

5. *P. callopismum*, (Ach.) bright yellow, orbiculari-radiate, adnate, rimoso-areolate and whitish in the centre, *lobato-laciniate at the circumference, laciniæ broad, thin, membranous, contiguous, very closely appressed, plane, dilated and inciso-crenate at the apices, smooth* on the upper surface ; apothecia *bright orange, disk smooth, waxy*, margin *bright yellow, thickish, flexuose* or *sub-crenulate ;* spores 8, colourless, *lemon-shaped*, polari-bilocular ; K red or purple.

On rocks, walls, &c., frequent.

SYN :—Ach. L. U. 437. (1810.) Syn. 184. Mudd Man. 133. Nyl. in Bull. Soc. Bot. 13. p. 366.
FIG :—Hepp Sporen t. 103. f. 907. E. Bot. 2157. upper fig.
EXS :—Nyl. 36. Hepp 907. Mass. 103. Schær. 337. Anzi It. S. 134. Arn. 488.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5, 6, 7...10...14, 15...30.
ENGLAND :—Craig-y-Rhiw ! near Oswestry, Shropshire. *Rev. T. Salwey.* Danby Castle ! Bilsdale, Cleveland. *Mr. Mudd.* Torquay, Devon. *Dr. Holt.* Budleigh Salterton, Devon. *Dr. Dickie.* Llanymynech Hill ! Shropshire.
SCOTLAND :—Old Aberdeen and Stirling ; near Edinburgh. Dunblane. *Rev. J. M. Crombie.*

IRELAND :—Co. Down. *Dr. Maingay.*
WALES :—Southerndown, Glamorgan. *Dr. Holl.* Eglwyseg rocks! Great Orme's Head! Giltar Point! Tenby.
"Spores .0025 to .00325 in. long, by 0015 in. broad, t. 2. f. 42." *(Mudd.)* "Spores .008—13 mm. long, .006—10 mm. broad." *(T. M. Fr.)*

Var. *plicatum*, Wedd. *laciniæ* of thallus *narrow, convex, incurved and sub-crenate at the apices*, precisely like those of *P. murorum*, but *smooth and waxy* on the upper surface; spores *lemon-shaped;* K red or purple.

On rocks, &c., frequent.

SYN :—Weddell in Bull. Soc. Bot. 16. p. 200. (1869.) Nyl. l. c. 13. 366.
FIG :—Hepp Sporen t. 22. f. 197.
EXS :—Hepp 197. Anzi Langob. 444. a. Mass. 94. 95. Anzi S. 134. b. Fellm. 103. Mudd 96.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...5, 6, 7...10...15...26.
ENGLAND :—Craig-y-Rhiw! near Oswestry, Shropshire. *Rev. T. Salwey.* Yorkshire! *Mr. Dixon.* Aymestry! Herefordshire. Llanymynech Hill! Shropshire. Norton Camp! near Craven Arms.
SCOTLAND :—Blair Athol. *Rev. J. M. Crombie.*
IRELAND :—Dawros river! co. Galway. *Mr. Larbalestier.*
WALES :—Eglwyseg rocks! Gimlet rock! Pwllheli. Fishguard! St. David's! Pembrokeshire. Great Orme's Head!

Var. *sympagea*, (Ach.) *dark orange-coloured*, orbicular, sub-imbricate, foliaceous and lobate, plane in the circumference; *apothecia minute, concolorous.*

On calcareous rocks. 1876.

SYN :—Ach. Prod. 105. Univ. 437. Syn. 184.
IRELAND :—Ruin at Cleghan, Galway. *Mr. Larbalestier* (1876.)

6. *P. citrinum*, (Ach.) yellow, crustaceous, *effuse, granuloso-leprose, rimoso-areolate*; apothecia yellowish-orange, plane, margin *sub-entire, pulverulent;* spores 8, colourless, ellipsoid, polari-bilocular. K purple.

On rocks, walls, mortar, &c., frequent. 1807.

SYN :—Ach. Prodr. 73. (1798.) Nyl. Scand. 136. Mudd Man. 132.
FIG :—E. Bot. 1793. Hepp Sporen t. 9. f. 72.
EXS :—M. & N. 742. Nyl. 35. Hepp 72. Leight. 86. Anzi Ven. 25.
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—1...3, 4, 5...7...10...(19—30)...31.
ENGLAND :—Norfolk. *Sir J. E. Smith.* Yorkshire. *Mr. Hailstone.* Worcester! *Dr. Holl.* Heavitree, Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* near Monmouth. *Mr. W. Joshua.* Torquay! Devon. *Dr. Deakin.* Shrewsbury! Broomhill! and Shropshire, frequent!!
SCOTLAND :—Frequent in the lowland districts. *Rev. J. M. Crombie.*
IRELAND :—On mortar, common. *Mr. Carroll.*
WALES :—Barmouth!
CHANNEL ISLANDS :—Jersey; Guernsey; Sark; *Mr. Larbalestier.*
"Spores .003 in. long, by .0015 in. broad." *(Mudd.)* "Spores .010—15 mm. long, .005—8 mm. broad." *(Nyl.)*

7. *P. elegans*, (Link.) *dark orange-red*, suborbiculari-stellate, laciniæ *distinct, linear*, narrow, *multifid*, upper surface *glabrous;* apothecia dark orange-red, plane, margin entire; spores 8, colourless, ellipsoid, polari-bilocular.

On exposed rocks and stones, rare.

SYN :—Link. in Ann. Bot. 1. 37. (1794.) Nyl. Scand. 136. Mudd Man. 131.
FIG :—Hepp Sporen t. 22. f. 195. E. Bot. 2181. (right hand fig. only). Flora 1875. t. 5. f. 6.

Exs :—Schær. 481. (left hand specimen.) Anzi It. S. 133. c.
Geog. Distrib :—Europe, Arctic America, N. Zealand.
Bot. Prov :—8...11, 12...14, 15...31.
Scotland :—Lochnagar. *Adm. Jones.* Cairngorm, Grampians. *Rev. J. M. Crombie.* Ben Mac Dhui. *Dr. Dickie.*
"Spores .0025 to .003 in. long, by .001 to .0015 in. broad, t. 2. f. 41." *(Mudd.)* "Spores .011—16 mm. long, .006—9 mm. broad." *(Nyl. & T. M. Fr.)*

8. *P. fulgens*, (Sw.) *albido-flavescent* or *citrine*, orbicular, *sub-monophyllous, adnate, radiato-incised* towards the circumference, laciniæ subplicato-contiguous, crenate, upper surface *granulato-pulverulent ;* apothecia orange-coloured, plane, margin thick, entire, pale yellow ; spores 8, colourless, ellipsoid, simple. K purple.
On the earth amongst rocks, rare. 1801.

Syn :—Swartz in Nov. Act. Acad. Upsal. 4. 246. (1784.) Ach. Syn. 183. Nyl. Scand. 137.
Fig :—E. Bot. 1667. Hffm. Pl. L. t. 48. f. 2. Hepp Sporen t. 21. f. 194.
Exs :—Hepp 194. Mass. 2. Schær. 339. M. & N. 1052. Larbal. 27. Anzi Langob. 99. Anzi Etr. 53.
Geog. Distrib :—Europe, Africa.
Bot. Prov :—1, 2...6...16...31.
England :—Freshwater Bay, Isle of Wight; New Haven, Sussex. *Messrs. Turner & Borrer.* Bray Hill. St. Minver near Padstow ! *Mr. Tellam.*
Scotland :—Ben Brecht, Argyleshire. *Mr. Paterson.*
Wales :—Near Stackpole Court, Pembroke. *Mr. Adams.* (1801.) Lydstop ! Pembroke. *Rev. T. Salwey.*
Channel Islands :—Quenvais ! Jersey; Grosse Rocque, Guernsey. *Mr. Larbalestier.* North side, Guernsey. *Miss Lukis.*
"Spores .0025 in. long, by .001 in. broad." (*Mudd.*) "Spores .009—.012 mm. long, .005—6 mm." (*Nyl.*) "Spores .007—12 mm. long, .004—5 mm. broad." (*T. M. Fr.*)

B. *Thallus cinerascent.*

9. *P. candicans*, (Dicks.) *glaucous* or albo-cinerascent, tartareous, *orbiculari-squamose, adnate, subareolate and plane in the centre, radiato-plicato-lobate, rotundo-dilated and crenate at the apices*, smooth or pulverulent; apothecia appressed, brownish-black, more or less pruinose, thallodal margin *persistent ;* spores 8, colourless, ellipsoid, 1-septate. (K—C—).
On limestone rocks, frequent. 1793.

Syn :—Dickson Br. Crypt. 3. 15. (1793.) Nyl. Prodr. 72. Mudd Man. 133. *Lecanora epigæa*, Ach. Syn. 179.
Fig :—E. Bot. 1778. Dicks. Crypt. 3. t. 9. f. 5. Hepp Sporen t. 104. f. 914.
Exs :—Zw. 111. Nyl. 117. Mass. 210. Arn. 223. a. b. Leight. 218. Hepp 914. Anzi Etr. 12. Rabh. 748.
Geog. Distrib :—Europe.
Bot. Prov :—1, 2...5...7, 8...10, 11...15.
England :—Yorkshire. *Mr. Dickson.* (1793.) Cheddar ! near Bristol ; Beachy Head ! Sussex. *Mr. Borrer.* Oswestry ! Shropshire. *Rev. T. Salwey.* Teesdale, Durham. *Rev. J. Harriman.* St. Vincents Rocks, Bristol. *Miss Atwood.* near Buxton. *Dr. Holl.* Chudleigh, Devon. *Mr. Parfitt.* Malvern, Worcester. *Mr. Varenne.* Llanyblodwel Rocks ! Llanymynech Hill ! Wrekin Hill ! High Rock ! near Bridgnorth, Shropshire.
Scotland :—Near Sheean Ferry. *Messrs. Turner and Hooker.*
Wales :—Great Orme's Head ! Eglwyseg Rocks !

10. *P. Cesatii*, (Mass.) *albido-glaucous*, pruinose, tartareous, *orbiculari-squamose, adnate, areolato-verrucose in the centre, radiato-undulato-plicate in the circumference, laciniæ narrow, convex, incurved*

*and inciso-crenate at the apices;* apothecia *brownish-black, sessile, cæsio-pruinose,* thick *margin* eventually *nearly obliterated;* spores 8, colourless, ellipsoid, 1-septate. (K—C—).

On limestone rocks, rare. 1875.

SYN :—Mass. Mem. 47. 1855.
FIG :—Mass. Mem. t. 8. f. 46.
EXS :—Mass. 141. Anzi Langob. 447.
GEOG. DISTRIB :—Italy.
BOT. PROV :—5.
ENGLAND :—Sherbourne! Gloucestershire. *Mr. Joshua.*
"Spores .0100 mm. long, .00336 mm. broad." *(Mass.)*

11. *P. chalybæum,* (Duf.) *plumbeo-albicant* or cinereo-albescent, adnate, smooth, *diffracto-areolate, obsoletely lineari-radiate* at the circumference, hypothallus blackish, slightly extended beyond the thallus; apothecia *innate* or immersed, black, plane, more or less pruinose, *thalline margin entire,* depressed; spores 8, colourless, elliptico-oblong, polari-bilocular.

On limestone rocks, rare. 1861.

SYN :—Dufour in Fries L. Eur. 125. (1831.) Nyl. Scand. 138. Mudd Man. 134.
FIG :—Hepp Sporen t. 22. f. 204.
EXS :—Hepp 204. Schær. 566. Zw. 226. Anzi Langob. 35.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...7...10...15.
ENGLAND :—Near Renhill, Yorkshire. *Mr. Baker.* Babbiecomb, Devonshire *Adm. Jones.* Yatton, Somerset. *Mr. Joshua.* Llanymynech Hill! Shropshire.
SCOTLAND :—Craig Tulloch! Blair Athole. *Rev. J. M. Crombie.*
WALES :—Eglwyseg Rocks! near Llangollen, Glyn! near Capel Curig.
"Spores .0025 to .00275 in. long, by .0015 in. broad." (*Mudd.*) "Spores .011—15 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .011 mm. long, .0045 mm. broad.

12. *P. variabile,* (Pers.) *fusco-cinerous,* adnate, *diffracto-areolate,* hypothallus nigricant, predominant; apothecia prominent, black, plane, more or less pruinose, *thalline margin* thin, *white, sub-crenulate;* spores 8, colourless, elliptico-oblong, polari-bilocular.

On rocks, rare.

SYN :—Pers. in Ust. Ann. Bot. 7. 26. (1794.) Ach. 165. Nyl. Scand. 138.
FIG :—Hepp Sporen t. 9. f. 74.
EXS :—Anzi It. S. 143. Rabh. 794. Hepp 74.
GEOG. DISTRIB :—Scandinavia, Italy.
BOT. PROV :—1...5...8...15...26.
ENGLAND :—Buxton, Derbyshire! *Dr. Holl.* Grove Lane, Cirencester. *Mr. W. Joshua.* Bath! *Mr. C. E. Broome.* Llanymynech Hill! Shropshire.
SCOTLAND :—Craig Culliach. *Rev. J. M. Crombie.*
IRELAND :—Dawros River! co. Galway. *Mr. Larbalestier.*
"Spores .013—16 mm. long, .007—.010 mm. broad." (*Nyl.*) Spores .015—.017 mm. long, .007 mm. broad.

13. *P. Ayardhianum,* (Ach.) *fumoso-cinereous,* thin, effuse, contiguous, smoothish, *almost evanescent;* apothecia *fuscous-black, subinnate,* convex, thallodal margin, thin, white, entire; paraphyses distinct; spores 8, colourless, broadly oblong, polari-bilocular with longitudinal tube.

On limestone rocks and walls, frequent. 1871.

SYN :—Ach. Syn. 152. (1814.) Nyl. Syn. 139.
FIG :—Hepp Sporen t. 46. f. 407.
EXS :—Hepp 407. Arn. 50. Schær. 617.

GEOG. DISTRIB :—Europe.
BOT. PROV :—5, 6.
ENGLAND :—Llanymynech Hill! Shropshire. (1871.) near Cirencester. *Mr. Joshua.*
WALES :—Giltar Point! Tenby.

## SUB-TRIBE VI. EULECANOREI.

Thallus crustaceous, granulose, rarely radiate, smooth or leprose. Apothecia lecanorine, rarely biatorine. Paraphyses distinct. Spores simple, rarely septate, colourless, rarely fuscous. Spermatia various in form in different species, e.g. cylindrical or acicular, straight or arcuate, or oblongo-ellipsoid.

## VI. LECANORA. *(Ach.) Nyl.*

Characters as above. Thecæ either 8-spored or polysporous.

### A. *Spores numerous.*

1. *L. crenata*, Nyl. *bright full yellow*, sub-orbicular, effuse, *crenato or granuloso-squamulose* in the centre, *laciniato-radiate at the circumference*, laciniæ *sublinear, very narrow, convex*, incised, crenate and incurved at the apices (K—C—); apothecia darker yellow, plane, *thalline margin elevated, crenulate;* spores numerous, colourless, oblong or sub-ellipsoid, bilocular.

On maritime rocks. 1866.

SYN :—Nyl. Lapp. Or. 130. (1866.) *L. crenulata*, Wahlenberg Fl. Lapp. 416. Th. M. Fries Lich. Arctoi 70. Nyl. Scand. 140. Ach. Syn. 181.
EXS :—Th. M. Fries 58.
GEOG. DISTRIB :—Scandinavia, Norway. Greenland.
BOT. PROV :—7.
WALES :—Aberdovey! *Rev. A. Bloxam.* These Welsh specimens were sterile and not well developed, but the appearance of the laciniæ of the thallus accorded well with Fries Exs. 58! The asci especially the apices become blue with iodine.
"Spores .010—16 mm. long, .004—.005 mm. broad." *(T. M. Fr.)* "Spores .009—.015 mm. long. .004—.007 mm. broad." *(Nyl.)* Spores .012—.015 mm. long. .004—.0055 mm. broad. Hydrate of Potash just tinges the thallus a pale reddish brown.

2. *L. vitellina*, (Ach.) *pale greenish-yellow, granulose*, effuse, granules *minute, crenate or sublobulate*, or conglomerate (K—); apothecia tawny-yellow, plane, thalline margin entire or crenulate; spores numerous, colourless, oblong, simple or sub-polari-bilocular or obsoletely 1-septate.

On rocks, walls, old pales, &c. frequent. 1777.

SYN :—Ach. L. U. 403. (1810) Syn. 174. Nyl. Scand. 141. Mudd Man. 135.
FIG :—E. Bot. 1792. Hffm. Pl. L. t. 26. f. 1. Hepp Sporen t. 9. f. 70.
EXS :—Schær. 450. M. and N. 741. Hepp 70.
GEOG. DISTRIB :—Europe, N. America, Abyssinia.
BOT. PROV :—1, 2, 3, 4. 5...7...11...15...18...26...30, 31.
ENGLAND :—Northumberland and Durham. *Mr. Winch.* Exminster; Budleigh Salterton, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Wrotham, Maidstone, Tunbridge. *Mr. Holmes.* Hyde, near Cirencester. *Mr. W. Joshua.* near Christchurch. Eastbourne. *Mr. Roper.* Haughmond Hill! Middle! Longmynd! Shropshire.

SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay.* Killin. *Rev. J. M. Crombie.*
IRELAND :—Lurgedon Mountain, co. Antrim. *Dr. Moore.* Clegham ! co. Galway. *Mr. Larbalestier.*
WALES :—Aberdovey !
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .00275 to .003 in long, by .001 in. broad." *(Mudd.)* "Spores .008—15 mm. long .004—6 mm. broad." *(Nyl.)* "Spores .008—14 mm. long, .004—6 mm. broad." *(T. M. Fr.)*

Var. *coruscans*, (Ach.) *darker yellow*, granuloso-conglomerate, *areolato-diffract*, (K—); apothecia *imbedded*, *rufo-fuscous*, plane, thalline *margin granulato-crenulate*.

On rocks and palings, frequent.

SYN :—Ach. Meth. p. 177. (1803.) Syn. 174. Nyl. Scand. 141.
FIG :—Hffm. Pl. L. t. 27. f. 2.
EXS :—Bohl. 78.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...10...15...26.
ENGLAND :—Ayton ! Cleveland. *Mr. Mudd.* Middle ! Shropshire.
SCOTLAND :—Killin. *Rev. J. M. Crombie.*
IRELAND :—Bally-na-kill ! Galway. *Mr. Larbalestier.*

Var. *aurella*, (Ach.) yellow, *granulato-dispersed* or *evanescent*, (K—); apothecia minute, *bright orange*, plane, *scattered*, thalline margin entire.

On rocks, frequent.

SYN :—Ach. L. U. 404. (1810.) Syn. 175. Nyl. Scand. 141.
FIG :—Hffm. Pl. L. t. 50. f. 2. c. Hepp Sporen t. 9. f. 70.
EXS :—Anzi. It. S. 148. Hepp 70.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...15.
ENGLAND :—Middle ! Shropshire.
SCOTLAND :—Killin. *Rev. J. M. Crombie.*
WALES :—Conway ! and Diganwy !

Var. *epixantha*, (Nyl.) *leprose*, *pulverulent*, *pale yellow ;* apothecia *appressed or sub-immersed*, plane, concolorous, *margin thick*, *entire*, *often pulverulent*.

On turf walls. 1870.

GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.* (1870).

3. *L. candelaria*, (Ach.) greenish-yellow, *sub-orbiculari-stellate*, *minutely laciniate*, laciniæ *multifid*, subimbricate, crowded, *margins* curled, *crisped*, more or less *minutely granulose* (K—C—); apothecia fulvescent, margin entire or granulose ; spores numerous, colourless, ellipsoid, simple.

On old trees, pales, walls, rocks, &c., not common. 1782.

SYN :—Ach. L. U. 416. (1810.) Nyl. Syn. 412. Scand. 108. Mudd Man. 114.
FIG :—E. Bot. 1794. Nyl. Scand. t. 1. f. 2.
EXS :—Mass. 61. Anzi It. S. 131. M. and N. 743. a. (in part.) Rabh. 887.
GEOG. DISTRIB :—Europe, Arctic America.
BOT. PROV :—1...3, 4, 5 . 10, 11...14, 15...19...26...31.
ENGLAND :—Bolton Wood. *Dr. Carrington.* Northumberland and Durham. *Mr. Winch.* near Torquay. *Dr. Holl.* Kelvedon ; Lyston, Essex. *Mr. Varenne.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Hord's Park near Bridgnorth. *Mr. Purton.* Bedford, *Rev. C. Abbot.* Tunbridge Wells. *Mr. Jenner.* Penshurst Park Kent. *Mr. Holmes.*
SCOTLAND :—Blackford Hill near Edinburgh. *Sir. J. E. Smith.* (1782.) Killin ; Blair Athole ; Portlethen, Kincardineshire. *Rev. J. M. Crombie.*

IRELAND :—Near Cork. *Mr. Carroll.* Miderlin ! near Kylemore. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*
"Spores .002 in. long, by .001 in. broad." (*Mudd.*) "Spores .006—.014 mm. long, .004—6 mm. broad." (*Nyl.*) and (*T. M. Fr.*)

Var. *granulosa*, (Leight.) laciniæ very minute, crenate, margins ascending, *minutely and abundantly granulose*, often crowded into an areolato-diffracto-granulose crust, (K—).

On old trees, frequent.

EXS :—Zw. 322. Wright 79. Leight. 12.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Old Elms, Berwick ! near Shrewsbury.

4. *L. glaucocarpa*, (Whlnb.) pallescenti-livid, or *lurido-rufescent, squamulose, squamulæ dispersed or imbricate, crenate, margins upturned and white*, (K—C—) ; *apothecia large, fusco-rufescent*, plano-convex, *cæsio-pruinose* or naked, margin elevated, entire and flexuose ; spores numerous, colourless, oblong, simple.

On calcareous alpine rocks, not common.

SYN :—Whlnb. Nov. Act. Sc. Stockh. 27. 143. (1806.) Ach. Syn. 189. Nyl. Scand. 175. *percœna*, (non Ach ) Mudd Man. 159.
FIG :—Whlnb. l. c. t. 4. f. 4. Hepp Sporen t. 42. f. 377.
EXS :—Schær. 613. 341. Mass. 284. 283. 285. Anzi Langob. 328. 127. 329. Hepp 377. 378. Anzi It. S. 215.
GEOG. DISTRIB :—Sweden, Bavaria, Austria, Italy, Pyrenees, Switzerland, Lombardy, Hungary, Mackenzie River.
BOT. PROV:—5...9, 10...15.
ENGLAND :—Lancashire. *Mr. Jacob.* Cleveland. *Mr. Mudd.* Craig-y-Rhiw near Oswestry !
SCOTLAND :—Breadalbane ; Braemar ; Ben Lawers ; Morrone ; Craig Guie. *Rev. J. M. Crombie.*
"Spores .0075 in. long, by .00025 in. broad." (*Mudd.*) "Spores .003—6 mm. long., .0015—.0025 mm. broad." (*Nyl.*) "Spores 004—5 mm. long, .0015—20 mm. broad." (*T. M. Fr.*)

forma *pruinosa*, (Sm.) *crustaceous* (K—C—) ; *apothecia* of moderate size, scattered, appressed, plane, *reddish-black* or *black, white within, cæsio-pruinose* or naked, margin thin, entire, more or less undulate ; spores numerous, colourless, ellipsoid, simple.

On mortar, limestone rocks, &c. frequent. 1811.

SYN :—Smith E. Bot. 2244. (1811.) Nyl. Scand. 176.
FIG :—E. Bot. 2244. Hepp Sporen t. 17. f. 143.
EXS :—Anzi Langob. 395. 396. Anzi Venet. 78. Anzi It. S. 289. Hepp 143. Schær. 202. Mass. 334. 335. Mudd 160. Leight. 300.
GEOG. DISTRIB :—Hungary, Italy. Switzerland.
BOT. PROV :—2...3...5, 6, 7 ..10, 11...15 ..19.
ENGLAND :—Near Gainford, Durham. *Rev. J. Harriman.* (1811). Bilsdale ! Yorkshire. *Mr. Mudd.* Llanforda ! lane near Oswestry. *Rev. T. Salwey.* Sussex ! *Mr. Borrer.* near Malvern and Worcester ; near Shanklin, Isle of Wight. *Dr. Holl.* near Polesworth, Warwickshire. *Rev. A. Bloxam.* near Hereford. *Mr. W. Joshua.* Upperton, Eastbourne. *Mr. Roper.* Tetsworth ! Oxfordshire. *Mr. Larbalestier.* Sandbridge, Kent. *Mr. Holmes.* Wenlock ! High Rock ! near Bridgnorth ; Alberbury Castle Walls ! Shropshire.
SCOTLAND :—Highlands. *Rev. J. M. Crombie.*
IRELAND :—Monkstown and Dunkathal near Cork. *Mr. Carroll.*
WALES :—Meifod Church ! *Rev. T. Salwey.* Aberdovey ! *Rev. A. Bloxam.* Diganwy ! near Conway. Bracelet Bay ! Mumbles. Beaumaris !

Forma *eucarpa*, (Nyl.) *evanescent* ; apothecia reddish when moist,

blackish dry, very large, aggregate, *internally rufescent;* hypothecium thin, black; spores numerous, colourless, oblongo-ellipsoid, simple, most minute.

On rocks, rare. 1867.

SYN:—Nyl. Coll. Gall. Mer. Pyr. 14. (1853.) Prodr. 146.
GEOG. DISTRIB:—Pyrenees.
BOT. PROV:—5...31.
ENGLAND:—Wenlock! Shropshire.
CHANNEL ISLANDS:—Cove, Guernsey; north coast of Jersey. *Mr. Larbalestier.* (1867).
"Spores .0045 mm. long. .002 mm. broad." *(Nyl.)*

"Var. *depauperata*, (Kphlb.) on calcareous boulders on Craig Tulloch, Blair Athole. Under this var. I include f. *conspersa*, (Fr.) Th. Fr. Scand. p. 212. and f. *conferta*, Crombie Ms. both very sparingly in above locality; also f. *cinereo-pruinosa*, Anzi, which occurs on Craig Guie, Braemar." *Crombie in Journ. Bot. n. s.* 2. 134.

5. *L. squamulosa*, (Schrad.) *cervine* or badio-pallescent, or badio-fuscescent, *squamulose*, squamules *adnate, angular, and sublobate*, (K—C—); *apothecia at first immersed* and small, *then emersed* and plane, *rufo-fuscescent* or nigro-fuscescent, *thalline margin depressed;* spores numerous, minute, colourless, oblong, simple.

On rocks, frequent. 1801.

SYN:—Schrad. Crypt. 153. (1797.) Schrad. in Journ. Bot. 1801. 1. 75. *L. cervina*, (Pers.) Ach. Syn. 188 Nyl. Scand. 174. Mudd Man. 158.
FIG:—E. Bot. 2011. Hepp Sporen t. 8. f. 56.
EXS:—Hepp 56. Arn. 301. Schær. 183. 341. Anzi 216. Leight. 24.
GEOG. DISTRIB:—Bavaria, Hungary, Germany, Switzerland, Italy, Austria, France.
BOT. PROV:—1...5, 6...11...15...26...31.
ENGLAND:—Durham. *Rev. J. Harriman.* Leather Tor! Dartmoor. *Dr. Holl.* Muggleswick Fell and near Eglestone, Durham. *Mr. Winch.* Parkgate! Cheshire; Grinshill! Middle! Shropshire.
SCOTLAND:—Highlands! *Mr. Dickson.* (1801.) Loch Carron. *Messrs. Borrer and Hooker.* Kincardine. *Rev. J. M. Crombie.*
IRELAND:—Near Rinvyle! Kylemore Mountain! co. Galway. *Mr. Larbalestier.*
WALES:—Gimlet Rock! Pwllheli. Black Rock! near Criccieth.
CHANNEL ISLANDS:—Guernsey. *Rev. T. Salwey.*
"Spores .00075 in. long. by .00025 in. broad. t. 3. f. 53." *(Mudd.)* "Spores .008—011 mm. long. .004—6 mm. broad." *(Nyl.)*

forma *smaragdula*, (Whlnb.) *thalline squamulæ* plano-convex, *dispersed, pallescent* (K—C—); *apothecia minute, punctiform.*

On rocks, not uncommon. 1800.

SYN:—*Endocarpon*, Whlnb! in Ach. Meth. Suppl. 29. (1803,) Ach. Syn. 98. Nyl. Scand. 175. Mudd Man. 159.
FIG:—E. Bot. 1512. Leight. Ang. Lich. t. 4. f. 3.
EXS:—Fellm. 138. Leight. 271. 317. Mass. 62. 281. Hepp 175. Schær. 117. Mudd 132.
GEOG. DISTRIB:—Austria, Norway, Switzerland, Italy, E. Lapland.
BOT. PROV:—1...3...6, 7...10, 11...18...31.
ENGLAND:—Near Eglestone! Durham. *Rev. J. Harriman.* (1800.) Mountainous parts of Northumberland and Durham.! *Mr. Borrer.* Howden Gill! Ayton Moor; Cleveland. *Mr. Mudd.* Budleigh Salterton, Devon. *Dr. Dickie.* Exeter. *Mr. Parfitt.*
SCOTLAND:—Garrynahine, Lewis. *Dr. Lindsay.*
WALES:—Glandwr, Barmouth! Llandrindod! *Rev. T. Salwey.* Fishguard Harbour! Pembrokeshire.

CHANNEL ISLANDS :—La Moie, Jersey, *Mr. Larbalestier.*
Spores .003—.005 mm. long, .002 mm. broad.

forma *sinopica*, (Whlnb.) ferruginous-red, areolato-squamulose, appressed (K—C—); apothecia minute, punctiform, black.

On rocks in alpine places, not frequent. 1807.

SYN :—*Endocarpon*, Whlnb! in Ach. Meth. Suppl. 30. (1803.) Ach. Syn. 98. Nyl. Scand. 175. Mudd Man. 160.
FIG :—E. Bot. 1776. Leight. Ang. Lich. t. 5, f. 1.
EXS :—Hepp 768. Anzi It. S. 217. Schær. 116. Leight. 255. Smrft. 143.
GEOG. DISTRIB :—Switzerland, Italy, Norway.
BOT. PROV :—7. .12...15...31.
ENGLAND :—Mungrisedale! Cumberland. *Mrs. Stanger.*
SCOTLAND :—Aberfeldy; Ben Lawers. *Mr. H. Macmillan*, Braemar. *Rev. J. M. Crombie.*
WALES :—Anglesea. *Rev. H. Davies.* Bodowen! Glandwr! Barmouth. *Rev. T. Salwey.* Aber!
CHANNEL ISLANDS :—Guernsey, *Mr. Larbalestier.*
"Spores .0035—.004 mm. long, .002 mm. broad.

forma *privigna*, (Ach.) thallus nearly evanescent, *nigro-piceous* or dark brown (K—C—); *apothecia scattered, blackish, margin black, elevated, flexuose.*

On sandstone rocks, not frequent. 1810.

SYN :—Ach. Meth. 48. (1803.) Syn. 151. Nyl. Scand. 175. Mudd Man. 160.
FIG :—E. Bot. 2152! (two right hand fig).
EXS :—Mass. 64 Nyl. Pyr. Or. 37. Anzi Langob. 189. Zw. 143.
GEOG. DISTRIB :—Italy, Germany, Switzerland.
BOT. PROV :—1, 2...7.. 10, 11...31.
ENGLAND :—Eglestone! Durham. *Rev. J. Harriman.* (1810.) near Ayton! Cleveland. *Mr. Mudd.* Rottingdean! Sussex. *Mr. Borrer.* Lynmouth, N. Devon. *Miss Atwood.* near Gainford and Gateshead Fell, Durham; Heaton Dene and near Jesmond, Northumberland. *Mr. Winch.*
WALES :—Castell Diganwy!
CHANNEL ISLANDS :—L'etacq, Jersey. *Mr. Larbalestier.*

forma *Heppii*, (Naeg.) *greyish-white*, leprose, thin, effuse; *apothecia very minute, immersed, brown*, margin smooth, angular or flexuose.

On rocks.

SYN :—Naeg. in Hepp Fl. Eur. 57. Mudd Man. 160.
FIG :—Hepp Sporen t. 8. f. 57.
EXS :—Hepp 57. Arn. 185. Leight. 196.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...10.
ENGLAND :—Rottingdean! Sussex. *Mr. Borrer.* Boxley Hill, Sussex. New Forest, Hants. *Adm. Jones.* Lyndhurst Moor and Epping Forest. *Rev. J. M. Crombie.* Great Ayton! *Mr. Mudd.*
"Spores .001 in. long, by .00025 in. broad." (Mudd.) "Spores .004—.0045 mm. long, .0015—20 mm. broad." (*T. M. Fr.*)

forma *simplex*, (Dav.) nearly *ecrustaceous* (K—C—) *apothecia small, black, variously corrugate* or plicate; margin irregularly crenate; spores most minute.

On rocks, not uncommon. 1794.

SYN :—Davies in Linn. Trans. 2. 283. (1794.) Nyl. Scand. 176. Mudd Man. 160.
FIG :—Linn. Trans. 2. t. 28. f. 2. E. Bot. 2152. two left hand fig.
EXS :—Leight. 272. 273. Nyl. Pyr. Or. 13.
GEOG. DISTRIB :—Italy, Hungary, Germany.
BOT. PROV —1...5, 6, 7...15...19...31.
ENGLAND :—Tintagel! *Mr. Borrer.* Capstone Hill, Ilfracombe. *Miss Atwood.* Anstey Cove, Torquay. *Mr. Parfitt.* near Buckfastleigh, S. Devon. *Dr. Holl.* Church Stretton! Shropshire.

SCOTLAND :—Craig Tulloch ; Craig Guie ; Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Near Dunkerron. *Dr. Taylor.*
WALES :—Anglesea ! *Rev. Hugh Davies.* Aberdovey ! *Rev. A. Bloxam.* Barmouth ! Goodwick Bay ! near Fishguard, Pembrokeshire. Moel-y-gest ! near Tremadoc. North Cliff, Tenby !
CHANNEL ISLANDS :—La Moye, Jersey. *Mr. Larbalestier.*
"Spores .0005 to .00075 in. long, by .00025 to .0005 in. broad." *(Mudd.)*

6. *L. discreta*, (Ach.) *dark fuscous or badio-fuscous*, opake, *verrucoso-areolate*, areolæ somewhat *turgid*, contiguous or distinct, subrugulose (K—C—); apothecia concolorous, minute, one in each of the thalline verrucæ, epithecium minute obtusely impressed or somewhat convex in the centre, thalline margin obtuse ; spores numerous, colourless, ellipsoid, simple.

On mountain rocks, rare. 1870.

SYN :—Ach. Meth. Suppl. 41. (1803.) *L. admissa*, Nyl. Flora 1867. p. 370. Leight. L. Fl. 2d. ed. 185.
EXS :—Nyl. Pyr. Or. 36.
GEOG. DISTRIB :—Europe, Finland.
BOT. PROV :—7...15.
SCOTLAND :—Khoil and Craig Guie, Braemar. *Rev. J. M. Crombie.* (1870.)
WALES :—Y Fegle fawr ! near Barmouth. Castell Diganwy !
Spores .0035—.0045 mm. long, .0020 mm. broad.

7. *L. fuscata*, Schrad. *reddish-brown*, tartareous, *areolato-squamulose, areolæ angular, smooth and unpolished or rugged* (K—C red) ; *apothecia immersed, concave*, dark brown, margin entire, slightly raised ; spores numerous, minute, oblongo-ellipsoid, simple.

On rocks and walls, frequent. 1830.

SYN :—Schrader Spic. Germ. 83. (1794.) Nyl. Scand. 175. *Sagedia rufescens*, Ach. Syn. 135. *Endocarpon rufo-virescens*, Tayl. Fl. Hib. 2. 100.
FIG :—E. Bot. Suppl. 2657. Leight. Ang. Lich. t. 4. f. 4.
EXS :—Mudd 131. Rabh. 872.
GEOG. DISTRIB ;—Europe.
BOT. PROV ;—1...4, 5...7...10, 11...15...19...31.
ENGLAND :—Gorlestone ! Suffolk. *Mr. Borrer.* (1830.) Guisbro' Moor ! Cleveland. *Mr. Mudd.* Lamorna ! Cornwall ; Craigforda ! Oswestry. *Rev. T. Salwey.* Great Ayton ! *Mr. Dixon.* Northumberland ! and Durham ! *Mr. Robertson.* Sutton Bank. Thirsk ! *Mr. Baker.* Buckston, near Monmouth. *Mr. W. Joshua.* Wrekin ! Laurence Hill ! Nesscliffe Hill ! Haughmond Hill ! Lyth Hill ! Shropshire.
SCOTLAND ;—Ben Lawers. *Rev. J. M. Crombie.*
IRELAND :—Cappaghmore near Dunkerron ! *Dr. Taylor.*
WALES :—Barmouth ! *Rev. T. Salwey.* Trefriw ! Llyn Geirionydd !
CHANNEL ISLANDS :—L'etacq ; La Moie, Jersey. *Mr Larbalestier.*
"Spores .003—4 mm. long, .001—.0015 mm. broad." *(Nyl.)* Spores 005—7 mm. long, .0015—.002 mm. broad.

8. *L. Sambuci*, (Pers.) *whitish or cinerascent*, very thin, *effuse*, granulose or sub-leprose or *almost evanescent* (K—) ; *apothecia fuscous or fusco-rufescent, minute, plane, thalline margin white, crenulate ;* spores 12, 16 or 32, rarely 8, colourless, ellipsoid, simple.

On trees, rare.

SYN :—Persoon in Ust. Ann. Bot. st. 7. 26. (1794.) Nyl. Scand. 168. Crombie Enum. 53.
EXS :—Arn. 300.
GEOG. DISTRIB:—Mid Europe, Sweden.
BOT. PROV :—28.
IRELAND ;—Armagh. *Adm. Jones.*

"Spores .008—.012 mm. long, .005—7 mm. broad" (*Nyl.*) Spores .009—.12 mm. long, .005—7 mm. broad. (*T. M. Fr.*)

9. *L. hypophæa*, (Nyl.) *cinerascent or cinereo-virescent*, thin, *granulato-unequal; apothecia nigricant* or sanguineo-black, *lecideine*, somewhat plane, marginate, proper *margin* black, *sub-crenulate* or unequal or *undulate*, then convex and immarginate; spores numerous, colourless, oblong, simple; paraphyses moderate or thickish, articulate, apices thicker, electrino-fuscescent; hypothecium colourless, fuscous-black beneath, and with glomerulose gonidia; gelatina hymenea at first blue then vinose or fulvous red with iodine.

On granite rocks, very rare. 1869.

SYN:—Nyl. in Flora 1870. p. 34. Crombie in Seem. Journ. Bot. 8. 97.
GEOG. DISTRIB:—Europe.
BOT. PROV:—15.
SCOTLAND:—Near Old Machar Cathedral, Aberdeen. *Rev. J. M. Crombie.* (1869).
Allied to *privigna*, Ach. but distinguished chiefly by its greyish-green granulate thallus, and crenulate or undulate margin of the apothecia. *Crombie.*
"Spores .005—6 mm. long, .0015 mm. broad." (*Nyl.*)

10. *L. peliscypha*, (Whlnb.) *fusco-castaneous*, cartilaginous, *glebulose*, glebulæ at first distinct, bearing apothecia in their centre, at length formed into *decumbent appressed imbricated squamæ* (K—C—); *apothecia atrofuscous, sub-immersed*, submarginate; spores numerous, minute.

On maritime and subalpine rocks, frequent. 1871.

SYN:—Whlnb. in Suppl. Ach. Meth. 40. (1803.) Nyl. in Flora 1872. p. 364. Crombie in Journ. Bot. n. s. 2. 134.
GEOG DISTRIB:—Scandinavia.
BOT. PROV:—15.
SCOTLAND:—Coast of Kincardineshire. *Rev. J. M. Crombie.* (1871).

B. *Spores* 8, *simple.*

* *Thallus K yellow then red.*

11. *L. cinerea*, (L.) *cinereous or albido-cinereous*, rimoso-areolate or areolato-diffract or verrucoso-areolate, areolæ plane or convex; *hypothallus nigricant; apothecia black, naked*, immersed or sessile, concave or plane, *thalline margin entire;* hypothecium colourless; spores 8, colourless, ellipsoid, simple; paraphyses gelatinoso-conglutinate; gelatina hymenea I blue then fulvescent; spermatia acicular, straight; *medulla I—; thallus K yellow then red.*

On granitic and hard rocks, frequent.

SYN:—Linn. Mant. 1. p. 132. (1767.) Ach. Syn. 140. Nyl. Scand. 153. Th. Fr. L. Scand. 280.

forma *rimoso-areolata*, Leight. cinereous or albido-cinerascent, *rimoso-areolate, areolæ flat or plane, apothecia* more or less *immersed.*

EXS:—Schær. 126. 127. Mass. 270. Anzi Ital. S. 207.
GEOG. DISTRIB:—Switzerland, Pyrenees, Italy, Hungary.
BOT. PROV:—7...31.
WALES:—Pen-maen-mawr! Cader Idris! Llyn Cae! Crib Goch! Snowdon.
CHANNEL ISLANDS:—Beauport! Jersey. *Mr. Larbalestier.*

forma *diffracto-areolata*, Leight. albido-cinerascent, coarsely *diffracto-areolate*, *areolæ* more or less irregularly *convex ; apothecia subsessile*, concave, margin prominent.

EXS :—Schær. 620.
GEOG. DISTRIB :—Switzerland, Hungary, Sweden, Italy.
BOT. PROV :—26.
IRELAND :—Dawros Bridge ! co. Galway. *Mr. Larbalestier.*

forma *verrucoso-areolata*, Leight. albido or sublutescenti-cinereous, *verrucoso-areolate*, *areolæ* small, convex, *verrucose ; apothecia sessile*, margin prominent.

EXS :—Zw. 4. Rabh. 921. Richardson. 124.
GEOG. DISTRIB :—Arctic America, Hungary, Norway, Sweden, Switzerland, Germany, Lapland.
BOT. PROV :—31.
CHANNEL ISLANDS :—Noirmont ! Jersey. *Mr. Larbalestier.*

forma *lepidota*, Leight. *cinereo-fuscescent*, *squamoso-areolate*, squamæ convex or rugose ; *apothecia innate*, margined.

SYN :—Grevillea 3. p. 116.
BOT. PROV :—7...31.
WALES :—Barmouth ! Pwlhelli ! Moel-y-gest !
CHANNEL ISLANDS :—Beauport ! Jersey. *Mr. Larbalestier.*

12. *L. Myrini*, (Fr.) cinerascent or *lutescent*, tartareous, rimoso-areolate, contiguous, areolæ smooth or verruculoso-rugose, hypothallus black (thallus K *yellow then red*, *medulla I blue*) ; apothecia somewhat plane, *black*, *naked*, or slightly pruinose ; hypothecium colourless ; spores 8, colourless, ellipsoid, or globoso-ellipsoid, simple ; paraphyses cohærent ; gelatina hymenea blue with iodine ; spermatia subcylindrical.

On sub-alpine rocks.

SYN :—*Parmelia*, Fr. S. V. Sc. 108. (1845.) *Lecanora*, Nyl. Flora 1869. p. 413. Th. M. Fries Scand. 283. Leight. in Grevillea, 1. 125.
EXS :—Fellm. 121.
GEOG. DISTRIB :—Lapland, Sweden.
WALES :—Barmouth ! *Rev. T. Salwey.*

13. *L. præpostera*, (Nyl.) *white*, thin, nearly smooth, *areolato-rimose*, sub-fimbriated and darkly limited at the circumference (K yellow then cinnabarine-reddish) ; *apothecia blackish*, opake, glauco-suffused or subdenudate, moderate, thalline margin *rugulose or subcrenate ;* spores 8, colourless, ellipsoid, simple ; paraphyses slender ; epithecium yellowish ; gelatina hymenea and especially the thecæ bluish with iodine.

On maritime basaltic rocks, rare. 1872.

SYN :—Nyl. in Flora 1873. p. 19. Crombie in Grevillea 1. 141.
BOT. PROV :—31.
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.* (1872.)
Not unlike some state of *L. subfusca var. atrynea*, but distinct by the smaller spores, chemical reaction and other characters. Spores .009—14 mm. long, .005—6 mm. broad.

14. *L. oculata*, (Dicks.) *white* or albo-cinerascent, *dactylino-papillate*, glabrous ; apothecia at first *innate* in the apices of the papillæ, ultimately expanded, *sub-concave*, black, thalline margin thick, *inflexed*, entire ; spores 8, colourless, ellipsoid, simple ; thallus K ferruginous-red.

On mosses in alpine localities, rare. 1790.

SYN :—Dicks. Crypt. 2. 17. (1790.) Ach. Syn. 148. Nyl. Scand. 156. Mudd Man. 156. *L. dactyliferus*, Whlnbg ! Lapp. 414.
FIG :—Dicks. Crypt. t. 6. f. 3. E. Bot. 1833.
EXS :—Th. M. Fr. 34. Rabh. 776. Fellm. 116.
GEOG. DISTRIB :—Norway, E. Lapland.
BOT. PROV :—3...15.
SCOTLAND :—Scotch Alps. *Mr. Dickson* (1790.) Ben Lawers. *Messrs. Turner & Hooker.* Cairngorm ; Braeriach and Bennaboord. *Adm. Jones & Rev. J. M. Crombie.*
"Spores .009 to .012 in. long, by .007 to .008 in. broad." (*Mudd.*) "Spores .023—30 mm. long, .011—14 mm. broad." (*Nyl.*) "Spores .018—30 mm. long, .011—14 mm. broad." (*T. M. Fr.*)

** *Thallus K yellow C red.*

15. *L. sarcopis*, (Whlnb.) *flavido-cinerascent*, granulose, thin, sub-effuse ; *apothecia small*, numerous, *carneo-rufous or sub-rufous*, plane or sub-convex, thalline *margin crenulate ;* spores 8, colourless, ellipsoid, simple ; thallus K yellow C red.

On trees and palings, not common.

SYN :—Wahlenberg Suppl. Ach. Meth. 40. (1803.) Ach. Syn. 177. Nyl. Scand. 165. Mudd Man. 150.
EXS :—Arn. 648.
GEOG. DISTRIB :—Russia, Austria, Hungary, Germany, Lapland, Switzerland.
BOT. PROV :—1...3...10...31.
ENGLAND :—Yorkshire. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* near Exeter. *Rev. J. M. Crombie.*
CHANNEL ISLANDS :—Beauport Bay, Jersey. *Mr. Larbalestier.*
"Spores .008—.012 mm. long, .006—8 mm. broad." (*Nyl.*) "Spores .008—15 mm. long, .004—.7 mm. broad." (*T. M. Fr.*) Spores .010 mm. long, .006 mm. broad.

*L. sarcopis* * *homopis*, (Nyl.) differs from the type by the gelatina hymenea becoming blue and then vinous-red with iodine.

On old pales. 1872.

SYN —Nyl. in Flora 1872. p. 251. Crombie in Journ. Bot. n. s. 2. 133.
EXS :—Fries L. S. 46 (fide Nyl.)
BOT. PROV :—3.
ENGLAND :—Near Finchley, Middlesex. *Rev. J. M. Crombie.* (1872).

16. *L. piniperda*, (Kbr.) *glaucous-white*, effuse, *verruculoso-leprose*, sometimes obsolete, hypothallus persistent, subarachnoid, white ; *apothecia minute, crowded, variously coloured ;* spores 8, colourless, minute, *oblongo-ellipsoid*, simple.

On decaying larch rails, rare. 1872.

SYN : —Korber Parerga 81. (1865.) Crombie in Journ. Bot. n. s. 2. 133.
FIG :—Hepp Sporen t. 9. f. 69.
EXS :—Hepp 385 & 69. Arn. 665.
GEOG. DISTRIB :—Germany.
BOT. PROV :—15.
SCOTLAND :—Near Loch Tummel, Perthshire. *Rev. J. M. Crombie.* (1872).

Var. *ochrostoma*, (Korb.) apothecia subbiatorine, yellow, *luteo-rufous*, sub-ferruginose, naked and immarginate.

On pine trees, rare. 1876.

SYN :—Korb. Par. 81.
GEOG. DISTRIB :—Germany.
BOT. PROV :—26.
IRELAND :—Lord Leitrim's Demesne ! Joyce county. *Mr. Larbalestier.* (1876).

17. *L. tartarea*, (L.) white or albo-cinerascent, tartareous, *granulato-conglomerate, rimulose;* apothecia *large*, scattered, disk plane, rugulose, *pallido-testaceous*, thalline margin *thick, inflexed and flexuose;* spores 8, colourless, elliptico-oblong, simple, large; *thallus and apothecia K yellow C red.*

On rocks, not uncommon. 1794.

SYN :—Linn. Sp. Pl. ed. 1. No. 14. (1753.) Ach. Syn. 172. Nyl. Scand. 157. Mudd Man. 156.
FIG :—E. Bot. 156.
EXS :—Maudon 5. 8. Zw. 324. Schær. 541. M. & N. 69. Welw. Lusit. 114. Bohl. 10. Leight. 82. Stenh. 128.
GEOG. DISTRIB :—Europe, Africa, America.
BOT. PROV :—1...5...7...10, 11...15...18...(19—30)...31.
ENGLAND :—Cliff-rigg! High Cliffs! Cleveland. *Mr. Mudd.* Clee Hill! Shropshire. *Rev. T. Salwey.* Yorkshire! *Mr. Dixon.* Hornby and Helmsley, Yorkshire. *Mr. Teesdale.* (1794.) Northumberland and Durham. *Mr. Winch.* Blackstone Rock; Lustleigh Cleve. Devon. *Mr. Parfitt.* Malvern Hills. *Mr. Purton.* Tors of Dartmoor; North Bovey, High Tor, Devon. *Messrs. Jones and Kingston.* Ightham, Kent. *Mr. Holmes.*
SCOTLAND :—Garrynahine, Lewis; Hills south of Ballater! Aberdeenshire; Abernethy! Perthshire; Birnam Hill! Dunkeld. *Dr. Lindsay.*
IRELAND :—Frequent. *Mr. Carroll.*
WALES :—Nannau; Snowdon; Cader Idris. *Mr. Holmes.* Barmouth! Conway Mountain! Glyder Vach! Capel Curig! Cwm Cywion!
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .009 to .012 in. long, by .005 in broad, t. 2. f. 51." (*Mudd.*) "Spores .040—72 mm. long, .027—40 mm broad." (*Nyl.*) "Spores .030—70 mm. long, .018—32 mm. broad." (*T. M. Fr.*)

forma *grandinosa*, Ach. *verrucoso-granulate, verrucæ sub-globose, glabrous.*

On trees, not common. 1810.

SYN :—Ach. L. U. 372. (1819.) Syn. 172. Nyl. Scand. 157.
EXS :—Spruce Amaz. And. 193. Anzi Langob. 431. Reich. & Schub. 63.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...10, 11...15.
ENGLAND :—Teesdale. *Rev. J. Harriman.* Hobhole near Castleton, Cleveland! *Mr. Mudd.*
SCOTLAND :—Inverary! *Mr. Piggott.*
WALES :—Glyn! near Capel Curig. Bettws-y-coed!
Spores .06 mm. long, .028 mm. broad.

forma *leprosa*, Nyl. thallus with numerous large globose soredia.

On mosses, not uncommon. 1876.

SYN :—Nyl. Lapp. Or. 135. (1866).
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...26.
IRELAND :—Killeray Bay! *Mr. Larbalestier.* (1876).
WALES :—Llyn Gwernan! near Dolgelley.

forma *frigida*, Ach. thallus thin, *papillose, ramuloso-spinulose.*

On mosses, not common.

SYN :—Ach. Meth. 166. (1803.) Syn. 172. Nyl. Scand. 157.
FIG :—E. Bot. 1879.
EXS :—Fellman 114. Anzi Langob. 101. Th. M. Fries 61.
GEOG. DISTRIB :—N. Europe, N. America.
BOT. PROV :—2..11...15.
ENGLAND :—Northumberland and Durham. *Mr. Winch.*
SCOTLAND :—Hills above Blair in Athol. *Mr. Don.* Lofty Hills. *Mr. Dickson.* Grampians. *Rev. J. M. Crombie.*
WALES :—Cwm Cywion! Conway falls! Capel Curig!

forma *gonatodes*, Ach. subramulose, branches divaricate, *tortuous, gibbose, lobato-verrucose*, difformed.

On mosses, rare. 1871.

SYN :—Ach. Prodr. 89. (1798.) Nyl. Scand. 157.
EXS :—Fellm. 115.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7.
WALES :—Cwm Tryfaen ! (1871.) Cwm Cywion !

18. *L. discolorella*, Nyl. "Somewhat similar to *L. leucophæa* Flk., but thallus whitish, thin, areolato-rimose (K yellow C red) and spores .012—16 mm. long, .006—7 mm. broad. Epithecium in a thin section rufescent. Spermatia arcuate, .020 mm. long, .0005 mm. broad."

On rocks, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 459.
BOT. PROV :—1.
ENGLAND :—Near Penzance, Cornwall. *Mr. Curnow.* (1876).

*** *Thallus K yellow C yellow.*

19. *L. Upsaliensis*, (L.) *albo-glaucescent*, thin, membranaceous, smooth; apothecia numerous, at first *globoso-verrucose, disk* at length *dilated, plane, pallido-lutescent, coarsely granulate*, margin thick, tumid, elevated, incurved, smooth; spores 8, colourless, ellipsoid, simple, large; *thallus and disk of apothecia K y. C y.*

On mosses, &c., rare. 1782.

SYN :—Linn. Sp. Pl. ed. 1. No. 17. (1753.) Ach. Syn. 169. Nyl. Scand. 157.
FIG :—E. Bot. 1634. Hepp Sporen t. 71. f. 623.
EXS :—M. & N. 1147. Hepp 623. Schær. 316.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...4...15.
ENGLAND :—Near Norwich. *Rev. H. Bryant.* (1782.) near Sprowston. *Messrs. Turner & Leathes.*
SCOTLAND :—Braemar. *Rev. J. M. Crombie.*

20. *L. varia*, (Ehrh,) greenish-*yellow or straw-coloured, granulose* or granulato-unequal, sub-determinate, thin; *apothecia concolorous* or flavo-pallescent or livido-virescent, thalline *margin entire* or sub-entire; spores 8, colourless, ellipsoid, simple; thallus K yellow C yellow.

On trees, palings, &c., common. 1801.

SYN :—Ehrh. Crypt. No. 68. (1785.) Ach. Syn. 161. Nyl. Scand. 163. Mudd Man. 149.
FIG :—E. Bot. 1666. Hoffm. Pl. L. t. 23. f. 4. Hepp Sporen t. 21. f. 190.
EXS :—M. & N. 840. Schær. 325. Hepp 190. Anzi It. S. 173. Bohl. 107. Fellm. 133. Stenh. 133. Leight. 51.
GEOG. DISTRIB :—Europe, Africa, N. America, N. Zealand.
BOT. PROV :—2, 3, 4, 5...7...10, 11...(19—30)...31.
ENGLAND :—Burgh Castle near Yarmouth. *Mr. Turner.* Battersby ! Cleveland. *Mr. Mudd.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Ragley Park pales, Warwickshire. *Rev. W. S. Rufford*, near Wetheldy, Warwickshire. *Mr. Purton.* near Cirencester. *Mr. W. Joshua.* Pevensey Road, Eastbourne. *Mr. Roper.* Greenhithe; Seven Oaks. Shoreham, Kent. *Mr. Holmes.* Monkmoor ! Loppington ! Berwick ! &c., Shropshire.
SCOTLAND :—Common, *Rev. J. M. Crombie.*
IRELAND :—Frequent. *Mr. Carroll.*
WALES :—Barmouth !
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

"Spores .002 to 0025 in. long, by .001 in. broad." (*Mudd.*) "Spores .010—14 mm. long, .005—8 mm. broad." (*Nyl.*) "Spores. 009—11 mm. long, .005—6 mm. broad." (*T. M. Fr.*)

21. *L. varia* * *leptacina*, (Smrft.) straw-coloured, thin, *granulato-squamulose*, granules smooth, crenate; apothecia *plane*, *olivaceous* or *nigricant*, obsoletely irrorato-pruinose, thalline margin *persistent*, thickish. (K f y C y)

Amongst mosses on boulders in alpine places, rare. 1871.

SYN :—Smrft. Suppl. 96. (1826.) Th. Fr. Scand. 260. Crombie in Journ. Bot. n. s. 2. 134. *L. varia f. terrestris*, Leight. Lich. Fl. 193.
EXS :—Smrft. 145.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Summits of Ben Lawers! and Ben-naboord. *Rev. J. M. Crombie.* (1871.)
"Spores .010—12 mm. long, .0045—60 mm. broad." (*T. M. Fr.*)

22. *L. subintricata*, (*Nyl.*) externally intermediate between *L. sæpincola* and *L. intricata*, but best distinguished by the minute spores and very slender paraphyses. It is often crustaceous with biatorine apothecia varying in color from pallido-lutescent, olivaceous or olivaceous-black, at length convex, entirely concolorous, (younger apothecia plane with lutescent margin).

On wood and bark. 1872.

SYN :—Nyl. in Flora 1868. p. 478. Th. Fr. Lich. Scand. 265. Crombie in Journ. Bot. n. s. 2. 133.
FIG :—Hepp Sporen t. 21. f. 192.
EXS: —Fellm. 133. Hepp 192.
GEOG. DISTRIB :—East Lapland.
BOT. PROV :—15.
SCOTLAND :—(*f. obscurior, Nyl.*) Killin & Blair Athole. *Rev. J. M. Crombie.* (1872).
"Spores .007—.010 mm. long, .0030—.0035 mm. broad." (*Nyl.*)

23. *L. atra*, (Huds.) *whitish or albido-cinerascent*, *granulose*, or granulato-unequal; *apothecia black*, *internally nigricant*, thalline margin entire, flexuose or sub-crenulate; spores 8, colourless, ellipsoid, simple; *section of apothecium K black*, thallus K yellow C yellow.

On rocks and trees, frequent. 1762.

SYN :—Huds. Fl. Angl. ed. 1. 445. (1762.) Ach. Syn. 146. Nyl. Scand. 170. Mudd Man. 145.
FIG :—E. Bot. 949. Hepp Sporen t. 20. f. 182. and t. 70. f. 613.
EXS :—Hepp 613. 182. Breutel 401. Fellm. 140. Zw. 63. Anzi It. S. 168. 189.
GEOG. DISTRIB :—Europe generally, Italy, Switzerland, Hungary, E. Lapland, Sweden. Tyrol Alps, Algeria.
BOT. PROV :—1, 2, 3, 4, 5...10, 11...15...18...(19—30.)—31.
ENGLAND :—Airyholme Wood! Cleveland. *Mr. Mudd.* Northumberland and Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* Croyde Bay, N. Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Cambridge. *Rev. R. Relhan.* Oxford. *Dr. Sibthorp.* Bedfordshire. *Rev. C. Abbot.* Moreton and North Bovey. Devon. *Rev. J. P. Jones.* Guestling, Sussex. *Rev. E. M. Bloomfield.* Edenbridge, Bexley, Hythe, Canterbury, Kent. *Mr. Holmes.* Pontesford Hill! Abdon! Shropshire! Stannor Hill! Herefordshire.
SCOTLAND :—Kinnoul Hill! Birnam Hill, Callernish and Garynahine, Lewis; Stennis, Orkney. *Dr. Lindsay.* Isle of May, Firth of Forth. *Mr. Sadler.*
IRELAND :—Common. *Mr. Carroll.* Kylemore Castle! *Mr. Larbalestier.*
WALES :—Between Corwen and Bala! Borth! Llyn Cwlyd! Glyn! near Capel Curig; Eglwyseg rocks! Craigforda! Moel-y-Golfa! Goodwick Bay! near Fishguard. Castel Dinas Bran! Tenby! Crib Coch!

CHANNEL ISLANDS :— Jersey ! and all the other Islands. *Mr. Larbalestier.*
Attention to the internal *nigricant* colour of the apothecium and its chemical reaction with K will prevent confusion with *L. subfusca* var. *coilocarpa* which it externally resembles, but in which the internal colour of the apothecium is pale and has chemical reaction K reddish, and also with *L. argopholis* in which the thallus has a yellowish tinge, and is squamuloso-granulose and the apothecia are fusco-nigrescent. How far *L. argopholis* is really distinct from *L. subfusca* may be questioned.
"Spores .003 to .004 in. long, by .00175 in. broad." *(Mudd.)* "Spores .010—015 mm. long, .006—7 mm. broad." *(Nyl.)* "Spores .010—.014 mm. long, .006—8 mm. broad. Spermatia very long, slender, straightish." *(T. M. Fr.)*

Var. *subbyssoidea*, (Strtn.) *nigro-cinereous* or almost *black*, granulose, effigurate, *hypothallus white*, *subbyssoid*.

On rocks, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 85. (1875.)
BOT. PROV :—15.
SCOTLAND :—Near Blair Athole. *Dr. Stirton.* (1875.)

24. *L. leucophæa*, (Flk.) *pallido-cinereous*, tartareous, *dispersoverrucoso-areolate*, areolæ tumid, hypothallus black ; apothecia appressed or sub-innate, *livido-fuscous*, plane, frequently congregated, margin thin, *fuscescent*, ultimately excluded ; *hypothecium pale ;* spores 8, colourless, ellipsoid, simple ; thallus K faint yellow, C faint yellow.

On sub-alpine rocks, not common. 1866.

SYN :—Korb. S. L. G. 194. (1855.) Leight. Not. Lich. No. xv. (1866.) Crombie Enum. 51.
EXS :—Crombie 63.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...15.
ENGLAND :—Spout Valley ! Long Mynd, Shropshire.
SCOTLAND :—Kincardine, Ben Lawers. *Rev. J. M. Crombie.*
IRELAND :—Near Kylemore and Doughruagh Mountain ! co. Galway. *Mr. Larbalestier.*
WALES :—Llyn Aran ! Mynydd-y-Gader ! and generally and abundantly on north enscarpment ! and also in Llyn-y-Cae ! on the south side of Cader Idris ! (1866). Crib Goch ! Snowdon ! Pass of Llanberis ! Aran Mowddwy ! Cwm Cwlyd ! Nant Gwynant !
Spores .014—.015 mm. long, .008 mm. broad.

Var. *conglobata*, (Flot.) apothecia *convex*, difformed and *tuberculate*, margin obliterated.

On quartzose boulders in alpine places. 1872.

SYN :—Flot. in Flora 1828. p. 564. Crombie in Journ. Bot. n. s. 1. 134.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Summits of Ben-y-gloe and Cairn Gowar, Blair Athole very sparingly. *Rev. J. M. Crombie.* (1872.)

25. *L. leucophæiza*, (Nyl.) similar to *L. leucophæa*, with biatorine apothecia and scarcely any gonidia present within the perithecium, but the gelatina hymenea not blueish with I or only the thecæ thus coloured ; thallus K f. yellowish.

On micaceo-schistose boulders.

SYN :—Nyl. in Flora 1874. p. 308.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar and Hill of Ardo near Aberdeen. *Rev. J. M. Crombie.* (1874.)
"Spores .010—13 mm. long, .006—8 mm broad." *(Nyl.)*

26. *L. nigro-glomerata*, Leight. *albido-glaucescent*, *sub-areolate*, *squamulose*, *squamules very small*, confluent around the glomerations of apothecia, otherwise dispersed, *adnato-appressed*, *plano-convex* or *depressed*, smooth and shining, crenulate, (K yellow C yellow); hypothallus black, appearing only on the margins of the squamules; *apothecia black*, *large*, *numerously conglomerate*, deformed by close proximity, *shining*, *convex*, internally colourless, margin thickish, slightly paler, prominent, flexuose; *hypothecium colourless*, *with only a small dusky-blackish lateral excipulum*, which is often continuous under the colourless hypothecium as a thin dusky line; paraphyses crowded, distinct; spores 8, colourless, ellipsoid, simple, moderate.

On alpine quartzose rocks, rare. 1870.

GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben-y-Gloe, summit of Cairn Gowar. *Rev. J. M. Crombie.* (1870.)
Approaching *L. rusticula*, Nyl. in general habit and appearance, but that it is a much more minute lichen, with a granular thallus and fuscous hypothecium. Externally with a general resemblance to *L. diducens*, Nyl., but distinct by the character of the squamulose thallus, the colourless hypothecium, the larger spores, and the apothecia being internally colourless. Gelatina hymenea I blueish then dirty lutescent. Spores .0115—.013 mm. long, .006—007 mm. broad.

27. *L. circinata*, (Pers.) *cinerascent* or cinerous-white, *orbicular*, *adnate*, *verrucoso-areolato-diffract* in the centre, *radioso-laciniate* at the circumference, *laciniæ narrow*, *plano-convex*, *contiguous*, incised and crenate at the apices, upper surface *minutely albo-depresso-granulate*; apothecia *innate*, sub-urceolate or plane, fuscous-black, margin entire; spores 8, colourless, ellipsoid, simple; thallus K yellow C yellow.

On limestone rocks, rare. 1783.

SYN :—Persoon in Ust. Ann. Bot. st. 7. p. 25. (1794.) Ach. Syn. 184. Nyl. Scand. 152. Mudd Man. 130.
FIG :—E. Bot. 1941. Hepp Sporen t. 89 f. 777. Relh. Fl. Cantab. 427. t. 6.
EXS :—Nyl. 118. M. & N. 457. Zw. 189. Schær. 328. Hepp 777. Anzi It. S. 163. Reich. & Schub. 75.
GEOG. DISTRIB :—Europe, Asia, Africa.
BOT. PROV :—4, 5...8...11, 12...15...31.
ENGLAND :—On Clare Hall Bridge, Cambridge; Grantchester Churchyard Wall. *Rev. R. Relhan.* (1783.) Kirkby Lonsdale, Westmoreland. *Sir J. E. Smith.* Bury. *Rev. G. R. Leathes.* Hale End! Malvern. *Dr. Holl.* Barnard Castle, Durham. *Rev. J. Harriman.* Canal Bridge near Congerstone, Leicestershire. *Rev. A. Bloxam.* Pophills; Oversley Bridge, Warwickshire. *Mr. Purton.* Pershore Bridge, Worcestershire. *Mr. W. Joshua.*
SCOTLAND :—Cathkin. *Mr. Hopkirk.* Clova. *Mr. Don.*
CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*
"Spores .0025 to .003 in. long, .00125 in. broad. Spermatia short, cylindrical, straight." *(Mudd.)* "Spores .011—15 mm. long, .0065—.0085 mm. broad. Paraphyses thick, generally distinctly articulate." *(Nyl.)* "Spores .011—15 mm. long, .006—8 broad." *(T. M. Fr.)*

28. *L. frustulosa*, (Dicks.) *albido-flavescent*, *thick*, tartareous, *verrucoso-areolate* or *disperso-glebulose*, *glebulæ sub-radiato-lobate*, *smooth*; *apothecia* numerous, sessile, *fuscous-black*, plane or sub-convex, thalline margin thick, entire or sub-crenate; spores 8, colourless, oblongo-ellipsoid, simple; thallus K yellow C yellow.

On alpine rocks, rare. 1793.

SYN :—Dicks. Crypt. 3. 13. (1793.) Nyl. Scand. 166. Mudd Man. 145.
FIG :—E. Bot. 2273.
EXS :—Leight. 293.
GEOG. DISTRIB :—Norway, Sweden, Silesia.
BOT. PROV :—7...15.
SCOTLAND :—Breadalbane ! *Mr. Borrer.* Yorkshire. *Mr. Dickson.* Ben Lawers! *Rev. H. Macmillan.*
WALES :—Arthur's Table, Anglesea. *Rev. A. Bloxam.*
"Spores .0025 in. long, by .001 in. broad. Spermatia cylindrical, elegantly curved or flexuose." (*Mudd.*) "Spores .010—12 mm. long, .006 mm. broad." (*Nyl. & T. M. Fr.*)

29. *L. argopholis*, (Whlnb.) *whitish or albido-stramineous, verrucoso-granulose, firm, granules imbricate*, rotundato-lobate; *apothecia fusco-nigrescent*, thalline margin entire or crenate; spores 8, colourless, oblongo-ellipsoid, simple; thallus K yellow C yellow.

On alpine rocks, rare.

SYN :—Wahlenberg in Ach. Meth. Suppl. 32. (1803.) Ach. Syn. 147. Nyl. Scand. 166.
FIG :—Hepp Sporen t. 20, f. 178.
EXS :—Fellm. 131.
GEOG. DISTRIB :—E. Lapland, Norway, E. Finland, Italy, Switzerland.
BOT. PROV :—6, 7...14, 15...26.
SCOTLAND :—Near Edinburgh. *Mr. Maughan.* Ben Lawers. *Rev. J. M. Crombie.*
IRELAND :—Letter Hill ! Dawros Bridge ! co. Galway. *Mr. Larbalestier.*
WALES :—Llyn-y-Cae ! Cader Idris ; Moel-y-Golfa ! Montgomeryshire. Glyn ! near Capel Curig ; Cwm Cywion ! Trefriw ! Fort Hill ! Fishguard.
"Spores .011—18 mm. long, .007—9 mm. broad." (*Nyl.*) "Spores .011—18 mm. long, .006—9 mm. broad." (*T. M. Fr.*)

30. *L. polytropa*, (Ehrh.) *pallido-sulphureous*, tartareous, *granulato-areolate, diffract*, often diffuse and sub-evanescent; apothecia *pale-yellowish-flesh-coloured*, plane or convex, *innato-sessile, margin concolorous*, thickish, *flexuose*, eventually obliterated; spores 8, colourless, ellipsoid, simple; thallus K pale yellow C deeper yellow.

On alpine rocks, &c, frequent. 1782.

SYN :—Ehrhart Crypt. No. 294. (1793.) Ach. Syn. 47. Nyl. Scand. 164. Mudd Man. 154.
FIG :—E. Bot. 1264. two lower fig. Hoffm. Pl. Lich. t. 58. f. 2. Hepp Sporen t. 8, f. 67.
EXS :—M. & N. 748. Schær. 321. Hepp 67. Anzi It. S. 200. Leight. 179.
GEOG. DISTRIB :—Sweden, Germany, Switzerland, Italy, Hungary, Norway.
BOT. PROV :—1, 2...5, 6...10, 11...13...15...18, 19...26...31.
ENGLAND :—Durham. *Rev. J. Harriman.* Lonsdale ! Cleveland. *Mr Mudd.* Eridge ! Ashington Common ! Sussex. *Mr. Borrer.* Torquay ! *Dr. Deakin.* Nesscliffe Hill ! Shropshire.
SCOTLAND :—Mountains of Breadalbane. *Rev. M. Stuart.* (1782.) Moors of Dumfriesshire. *Mr. Burgess.* Garrynahine, Lewis ; Stennis, Orkney, *Dr. Lindsay.* Breadalbane, Braemar. *Rev. J. M. Crombie.*
IRELAND :—Blackwater Hill ! co. Kerry. *Dr. Taylor.* near Lough Muck ! co. Galway. *Mr. Larbalestier.*
WALES :—Fort Hill ! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*
"Spores .0025 to .003 in. long, by .001 in. broad. Spermatia cylindrical, elegantly curved or flexuose." (*Mudd.*) "Spores .010—13 mm. long, .004—5 mm. broad." (*T. M. Fr.*) Spores .012—.0135 mm. long, .006 mm. broad.

forma *conglobata*, (Smrf.) thallus granulato-rugulose, rimose, greenish-yellow; *apothecia very numerous, crowded yet distinct, flavido-ochraceous, convex, deformed and tuberculate*, margin *obliterated.*

On alpine rocks, frequent.

SYN :—Sommerfelt Fl. Lapp. 83. (1826.) Nyl. Syn. 164. Mudd Man. 152.
EXS :—Mudd 120.
GEOG. DISTRIB :—Lapland, Switzerland.
BOT. PROV :—5...7...10...15.
ENGLAND :—Guisbro' Moor ! Ayton ! Cleveland. *Mr. Mudd.* Yorkshire ! *Mr. Dixon.* Mynydd-y-Myfyr ! near Oswestry. *Rev. T. Salwey.*
SCOTLAND :—Grampians. *Rev. J. M. Crombie.*
WALES :—Barmouth ! *Rev. T. Salwey.* Llyn Geirionydd !

forma *alpigena*, (Ach.) *pallido-lutescent*, tartareous, *rimoso-areolate, smooth ; apothecia concolorous, large*, appressed, plane, thalline *margin paler, elevated, persistent, flexuose.*

On alpine rocks, frequent. 1861.

SYN :—Ach. L. U. 379. (1810.) Syn. 170. Mudd Man. 152.
FIG :—Hepp Sporen t. 103. f. 903.
EXS :—Hepp 902. 903. Anzi It. S. 201. 202. Schær. 322.
GEOG. DISTRIB :—Switzerland, Italy.
BOT. PROV :—10...15.
ENGLAND :—Baysdale Moor, Cleveland. *Mr. Mudd.*
SCOTLAND :—Ben Nevis. *Adm. Jones.* Ben Lawers. *Dr. Holl.*

forma *illusoria*, Ach. *thallus evanescent ; apothecia dispersed, large, plano-convex*, pale yellow, margin almost obliterated.

On alpine rocks, rare.

SYN :—Ach. L. U. 380. (1810.) Nyl. Scand. 164. Crombie En. 52.
EXS :—Schær. 323.
BOT. PROV :—7...15...26.
GEOG. DISTRIB :—Switzerland, Norway.
SCOTLAND :—Mountains frequent. *Rev. J. M. Crombie.*
IRELAND :—Doughruagh Mountain ! (west side) co. Galway. *Mr. Larbalestier.*
WALES :—Y Wyddfa, Snowdon ! *Mr. Baker.*

31. *L. intricata*, (Schrad.) *sulphureo-virescent, squamoso-areolate, diffract, opake, areolæ minutely rugose, subcrenulate ; apothecia* adnate, plano-convex, *nigro-fuscous*, thalline margin pale, entire, generally obliterated ; spores 8, colourless, ellipsoid, simple ; *thallus K faint yellow C bright yellow.*

On alpine rocks, frequent.

SYN :—Schrader Journ. Bot. 1801. st. 1. p. 72. Ach. Syn. 154. Nyl. Scand. 164. Mudd Man. 152.
EXS :—Leight. 153. Arn. 56. Mudd 119.
GEOG. DISTRIB :—Hercynia, Silesia, Lapland, Westphalia, Bavaria.
BOT. PROV :—1...5...7...10...15...19...26.
ENGLAND :—Ayton Moor ! Kildale Moor ! Battersby ! Cleveland. *Mr. Mudd.* Babbicombe, Devon. *Mr. Parfitt.* Bodbury Ring ! near Church Stretton.
SCOTLAND :—Breadalbane and Portlethen, Kincardineshire. *Rev. J. M. Crombie.*
IRELAND :—Kilceanagh, co. Kerry. *Dr. Taylor.* Letter Hill ! Connemara. *Mr. Larbalestier.*
WALES :—Sychnant ! near Conway. Barmouth ! Cwm Bochlwyd ! Cwm Cywion ! Llyn Cwlyd ! Llyn Geirionydd !
"Spores .010—13 mm. long, .005—7 mm. broad." *(Nyl.)*

32. *L. phæops*, Nyl. *whitish-cream-coloured* or *dirty-whitish-brown*, tartareous, thin, determinate, continuous, *smooth, rimulose* (medulla I—, thallus K yellow C yellow) ; hypothallus white ; *apothecia fuscous*, small, scattered, *innate*, plane, immarginate, *internally fuscescent ; hypothecium darkly rufescent ;* spores 8, colourless, narrowly ellipsoid, simple ; paraphyses indistinct, epithecium colourless ; gelatina hymenea I intense persistent blue.

On wet alpine rocks, not common. 1844.

SYN :—*Lecanora*, Th. Fr. L. Scand. 287. *Lecidea*, Nyl. Scand. (1861.) p. 196. Salwey in Trans. Bot. Soc. Edin. 7. 554.
EXS :—Arn. 403.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...15...19...26.
SCOTLAND :—Ben Cruachan ; Ben Lawers. *Rev. J. M. Crombie.*
IRELAND :—Brandon Mount and Connor Cliffs ; Mangerton, Killarney. *Mr. Carroll.* near Dunkerron ! Cappamore Hill ! co. Kerry. *Dr. Taylor.* Connemara. *Dr. Moore.* Kylemore Castle ! co. Galway. *Mr. Larbalestier.*
WALES :—Plinlimmon. *Rev. T. Salwey.* (1844.) Llyn Aran ! Llyn-y-Cae ! Cade Idris ; Crib Coch ! Snowdon ; Capel Curig ! Cwm Idwal ! Cwm Bochlwyd ! Cwm Tryfan ! Cwm Cywion ! Glyder Vach ! Llyn Cwlyd ! Aran Mowddwy !
Mr. Crombie in litt. mentions a form *major* in which the thallus is thicker and the apothecia larger (twice as large.)
"Spores .009—.015 mm. long, .004 mm. broad." (*Nyl.*) "Spores .012—17 mm. long, .005—6 mm. broad." (*T. M. Fr.*) Spores .014—.015 mm. long, .0055—.006 mm broad.

33. *L. chlarotera*, Nyl. *white*, subtartareous, subdeterminate, areolato-diffract, *areolæ subturgid, minutely verrucoso-granulate* (K yellow C yellow) ; *apothecia pallido-testaceous*, large, scattered, sessile, plane or plano-convex, smooth, slightly pruinose, thalline margin flexuose, thickish, somewhat pulverulent ; *spores* 8, colourless, *rotundato or elliptico-oblong* ; *simple*, paraphyses distinct, thick.

On trees. 1876,

SYN :—Nyl. in Flora 1872, p. 550. & 1875. p. 15.
GEOG. DISTRIB :—Central Europe.
BOT. PROV :—26.
IRELAND :—Doughruagh Mountain ! and Ballinahinch ! near Letterfrack ! Connemara. *Mr. Larbalestier.* (1876.)
A most beautiful species, resembling a good deal in external appearance *L. tartarea*, (L.) but with different reaction and with spores with 2 nucleoli like those of *L. subfusca*. Spores .013—.015 mm. long, .008 mm. broad.

**** *Thallus K yellow C orange.*

34. *L. sulphurea*, (Hoffm.) *sulphureo-virescent, thickish*, tartareous, *rimoso-areolate*, smooth ; *apothecia livido-nigricant, biatorine, convex, deformed*, subpruinose, margin obliterated ; spores 8, colourless, ellipsoid, simple ; thallus K yellow C orange yellow.

On sub-alpine rocks, walls, tiling, &c., frequent.

SYN :—Hoffm. En. 32. (1784) Ach. Syn. 37. Nyl. Scand. 165. Mudd Man. 152.
FIG :—E. Bot. 1186. Hoffm. Pl. L. t. 11. f. 3. Hepp Sporen t. 21. f. 189.
EXS :—Zw. 3. Schær. 324. Hepp 189. Arn. 188. Mudd 121. Bohl. 117.
GEOG. DISTRIB :—Sweden, Germany, Switzerland, Scandinavia.
BOT. PROV :—2, 3, 4, 5...7...10...15...18, 19...23, 24...30, 31.
ENGLAND :—Cliffrigg ! Lounsdale ! Roseberry ! *Mr. Mudd.* Sussex ! *Mr. Borrer.* Malvern Hills ; Black Mountain, Monmouthshire. *Dr. Holl.* Coughton Church, Warwickshire. *Mr. Purton.* Bury, Suffolk. *Rev. E. N. Bloomfield.* Sandgate Cliff, Kent. *Mr. Holmes.* Stannor Hill ! Herefordshire ; Bodbury Ring ! near Church Stretton, Caer Caradoc ! Stiperstones Hill ! Shropshire.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.* Garrynahine, Lewis ; Stennis, Orkney. *Dr. Lindsay.*
IRELAND :—Pigeon Island near Kinmare. *Dr. Taylor.* near Belfast. *Mr. Templeton.* Glenarm. *Dr. Moore.* Killiney near Dublin. *Adm. Jones.* Glengariff, Cork, Kilkee and Ross, Clare, Mangerton, Kerry. *Mr. Carroll.*
WALES :—Diganwy ! near Conway. Bettws y-coed !
CHANNEL ISLANDS ;—Jersey ; Guernsey. *Mr. Larbalestier.*

"Spores .003 in. long, by .001 in. broad." (*Mudd.*) "Spores .010—16 mm. long, .005—6 mm. broad." (*Nyl.*) "Spores .010—15 mm. long, .005—6 mm. broad. Spermatia acicular, arcuate." (*T. M. Fr.*) Spores .0115 mm. long, .0045 mm. broad.

35. *L. symmicta*, (Ach.) *flavo-albicant*, thin; apothecia *pale* or pale-testaceous or pale-yellow, *biatorine*; spores 8, colourless, elongato-oblong, simple.

On trees and palings, frequent.

SYN:—Ach. L. U. 379. (1810.) Syn. 36. Nyl. Scand. 163. Mudd Man, 150.
EXS:—Fellm. 132. Anzi It. S. 174. Zw. 341. Mudd 117. Fries 45. Leight. 176. Smrft. 65.
GEOG. DISTRIB:—Scandinavia, New Zealand, Arctic America, Algeria, Sweden, Switzerland, Hungary.
BOT. PROV:—2, 3...5 ..7, 8...10...31.
ENGLAND—Gopsall! Leicestershire. *Rev. A. Bloxam.* Ayton! Cleveland. *Mr Mudd.* Kelvedon, Essex. *Mr. Varenne.* Epping Forest. *Rev. J. M. Crombie.* Moreton! Thame Park! Oxford! *Mr. Larbalestier.* Shoreham, Kent. *Mr. Holmes.* Loppington! Montford Bridge! Middletown! Haughmond Hill! Tugford! Shropshire.
WALES:—Tremadoc!
CHANNEL ISLANDS:—Beauport! St. John's, Jersey. *Mr. Larbalestier.*
"Spores .003 to .0035 in. long, by .00075 in. broad." (*Mudd.*) "Spores .010—13 mm. long, .004—5 mm. broad." (*T. M. Fr.*) Spores .013—.014 mm. long, .005—0055 mm. broad.

Var. *aitema*, (Ach.) yellow, *leprose*; apothecia *black*, *lecideine*, convex, small, whitish within; spores oblong, simple.

On trees, not common.

SYN:—Ach. L. U. 178. (1810.) Syn. 24. Nyl. Scand. 163. Mudd Man. 150.
FIG:—Hepp Sporen t. 9. f. 69.
EXS:—Hepp 69. Anzi It. S. 177. Crombie 66.
GEOG. DISTRIB:—Sweden, Switzerland, Italy.
BOT. PROV:—1...3...19.
ENGLAND:—Exminster Marshes, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.*
IRELAND:—Glanmire and Great Island, Cork. *Mr. Carroll.*

Var. *sæpincola*, (Ach.) *yellow*, *granulose* or granuloso-unequal; apothecia *dark-rufescent or black*, more or less *immersed*, convex, biatorino-lecideine; spores oblong, simple or slightly 1-septate.

On old palings &c. frequent.

SYN:—Ach. Syn. 35. (1817.) Nyl. Scand. 164. Mudd Man. 151.
FIG:—Hepp Sporen t. 21. f. 192.
EXS:—Mudd 118. Hepp 192. Anzi Langob. 303.
GEOG. DISTRIB:—Sweden, E. Lapland, Germany, Switzerland, Italy, Lombardy.
BOT. PROV:—1...5...10.
ENGLAND:—Near Battersby! Cleveland. *Mr. Mudd.* Exeter, Devon. *Rev. J. M. Crombie.* Stiperstones! Sutton! near Shrewsbury; Haughmond Hill!

36. *L. orosthea*, (Ach.) *flavicanti-sulphureous*, *thin*, *areolato-rimulose*, unequal, subpulverulent; *apothecia subconcolorous*, *flavido-carneous*, *convex*, or *tuberculoso-deformed*, *subpruinose*; spores 8, colourless, ellipsoid or oblong, simple; thallus K yellow C orange yellow.

On sub-alpine rocks.

SYN:—Ach. Prodr. 38. (1798.) Syn. 37. Nyl. Scand. 165.
GEOG. DISTRIB:—Switzerland, Germany, Sweden, Scandinavia, Italy.
BOT. PROV:—1...5...7...15...26.
ENGLAND:—Bolt Head, S. Devon. *Dr. Holl.* Long Mynd! near Church Stretton, Shropshire.

SCOTLAND :—Braemar. *Rev. J. M. Crombie.*
IRELAND :—River Dawros ! co. Galway. *Mr. Larbalestier.*
WALES :—Cwm Bychan ! *Rev. T. Salwey.* Aberdovey ! *Rev. A. Bloxam.* Glyn near Capel Curig. Llyn Cwlyd !

"Spores .003 in. long, by .00075 in. broad." (*Mudd.*) "Spores .009—.016 mm. long, .006—7 mm. broad." *(Nyl.)* Spores .011 mm. long, .004 mm. broad.

37. *L. expallens*, Ach. *pallido-sulphureous*, tartareous, *granulate, diffract, often pulverulent*, or *furfuraceous ; apothecia pallido-carneous*, innate, plano-convex, deformed, thalline margin concolorous, thin, sub-entire, eventually obliterated ; apothecia 8, colourless, ellipsoid, simple ; thallus K yellow C reddish orange.

On old trees and palings, not common.

SYN :—a. Ach. L. U. 374. (1810.) Syn. 171.
GEOG. DISTRIB :—France.
BOT. PROV :—1, 2, 3...5, 6, 7.
ENGLAND :—Sussex. *Mr. Borrer.* Wood opposite the Lodge near Ludlow, Herefordshire ! *Rev. T. Salwey.* Lewknor ! Tetsworth ! Oxfordshire. *Mr. Larbalestier.* Weston-super-Mare. *Mr. W. Joshua.* Old Eastbourne. *Mr. Roper.* Shere ! Surrey. *Dr. Capron.* Sharpstones Hill ! Shropshire.
WALES :—Trees base of Craig Breidden ! Montgomeryshire. Gwydir Woods ! Bettws-y-coed. Trefriw ! Towyn ! Glyn ! near Capel Curig.

38. *L. chlorophœodes*, Nyl. *flavido-glaucescent, verrucoso-granulate*, (K yellow C orange red) ; hypothallus very thin, black ; apothecia *fusco-rufescent or testaceo-rufescent*, moderate, somewhat convex, *margin thickish, crenate ;* spores 8, colourless, ellipsoid, simple.

On rocks, rare, 1873.

SYN :—Nyl. in Flora 1873. p. 290.
GEOG. DISTRIB :—Finland.
BOT. PROV :—26...31.
IRELAND :—River Dawros, Galway. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Vale Castle ! Guernsey. *Mr. Larbalestier.* (1873.)

"Spores .009—.011 mm. long, .006—8 mm. broad. Paraphyses indistinct. Gelatina hymenea I blue then lutescent, thecæ fulvescent." *(Nyl.)* Spores .010—.011 mm. long, .004—.005 mm. broad.

39. *L. lutescens*, (D.C.) *albido-flavescent, finely granulato-pulverulent ;* apothecia pale or *carneo-pallid*, thalline margin pulverulent ; spores 8, colourless, oblong, simple.

On old palings and trees, not common. 1790.

SYN :—D. C. Fl. Franc. 354. (1805.) *conizæa*, Leight. L. Fl. 2. ed. 193.
FIG :—E. Bot. 1549.
EXS :—Leight. 378.
GEOG. DISTRIB :—Scandinavia, France, Switzerland.
BOT. PROV :—2...4, 5...8...10...15...19...30...31.
ENGLAND :—Norfolk. *Mr. Turner.* Ripon, Yorkshire. *Mr. Brunton.* near Twycross. Leicestershire. *Rev. A. Bloxam.* Orpeth Valley and Rowland's Gill. Durham. *Rev. W. Johnson.* Buxton, *Dr. Holl.* Worthing. *Rev. T. Salwey.* Caer Caradoc ! Wrekin ! Pontesford, Stableford ! near Bridgnorth, Shropshire.
SCOTLAND :—Killin, Durris. *Rev. J. M. Crombie.*
IRELAND :—Derryquin. *Dr. Taylor.* Glenarm. *Dr. Moore.*
CHANNEL ISLANDS :—Beauport, Jersey ! *Mr. Larbalestier.*

40. *L. fugiens*, Nyl. *pale-whitish-yellow, granulate*, granules minute, scattered and diffuse, scarcely concrescent, (K yellow C orange yellow) ; *apothecia* very minute, scattered, sessile, *pale-yellowish-green*, thalline margin prominent, whitish-yellow, entire, sometimes crenulate or flexuose ; hypothecium colourless ; sub-hymeneal gonidia numerous and very large ; spores 8, colourless, lineari-oblong, simple.

On rocks, rare. 1873.

SYN :—Nyl. in Flora (1873.) p. 289.
BOT. PROV :—26...31.
IRELAND :—Dawros River ! co. Galway. *Mr. Larbalestier.*
CHANNEL ISLANDS :—On hard dry rocks under the shade of ivy near Archirondel Tower, Jersey ! *Mr. Larbalestier.* (1873.)
"Spores .009—013 mm. long, .005—6 mm. broad." (*Nyl.*) Extremely minute, and easily overlooked. Much resembling externally some state of *L. varia* or *polytropa.* Spores .010—.011 mm. long, .005—.006 mm. broad.

***** *Thallus K yellow C—.*

41. *L. subfusca,* (L.) *whitish or cinerascent,* more or less determinate, thin, *smooth, rimulose, granulate, verrucose, rugose* or *diffract,* hypothallus white ; apothecia *fuscous* or *fusco-pallescent* or *nearly black,* often pruinose, plano-convex, *margin* persistent, *entire* or *crenulate* ; spores 8, colourless, ellipsoid, simple ; thallus K yellow C—.

Forma *allophana,* Ach. whitish or albido-cinerascent, determinate or sub-determinate, thin, *unequal, rugose,* or *granulato-corrugate ;* apothecia plane or convex, rufo-fuscous, sub-rubricoso-fuscous, fuscous-black or black, thalline *margin* at first *entire,* then *crenate and flexuose ; paraphyses slender, not distinct.*

On trees.

SYN :—Ach. L. U. 395. (1810.) Syn. 158. Nyl. Scand. 160. Stizenberg in Bot. Zeit. 1868. p. 892.
FIG :—E. Bot. 219. Hepp Sporen t. 20. f. 183.
EXS :—Leight. 115. Anzi It. S. 184. Schær. 308. Spruce Amaz. 190. Bohl. 35. Maudon 53. Hepp 183. Stenh. 129. Smrft. 63.
GEOG. DISTRIB :—Throughout the world.
BOT. PROV :—1, 2, 3, 4, 5 7...10, 11...15...17...(19—30)...31.
ENGLAND :—Airyholme Wood ! Cleveland. *Mr. Mudd.* Oswestry ! *Rev. T. Salwey.* Northumberland and Durham. *Mr. Winch.* Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Wrekin ! Haughmond Hill ! Nesscliff ! Shropshire !
SCOTLAND :—Balthayock Woods ! Perth. *Dr. Lindsay.* Long Island. *Prof. Balfour..*
IRELAND :—Kylemore Lake ! co. Galway. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
WALES :—Glyn ! near Capel Curig. Gwydir Woods ! Bettws-y-coed.
"Spores .0025 to .003 in. long, by .00125 in. broad." (*Mudd.*) "Spores .013—22 mm long, .008—.012 mm. broad." (*Nyl.*)

Forma *Parisiensis,* Nyl. cinereous, rugose or rugoso-granulate or sub-verrucose, determinate, hypothallus not visible ; *apothecia black or fuscous-black* or rarely fuscous, naked, sometimes slightly cæsio-pruinose, moderate, nearly plane, *thalline margin rugose or sub-crenate ;* spores 8, ellipsoid *; paraphyses distinctly articulate,* slightly incrassate and broadly fuscescent at the apices ; gelatina hymenea blue with iodine.

On trees, rare.

SYN :—Nyl. Luxemb. Lich. in Bull. Soc. Bot. Franc. 13. p. 368. (1866.)
EXS :—Rabh. 802.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3.
ENGLAND :—Near Shanklin, Isle of Wight. *Dr. Holl.* Maidstone, Chelsfield, Shoreham, Kent, Buckingham. *Mr. Holmes.*
"Spores .010—.018 mm. long, .006—.008 mm. broad." (*Nyl.*)

Forma *rugosa*, (Pers.) whitish, thickish, determinate, often limited, *granulato-rugose;* apothecia *pale or fuscescent*, plane, *margin elevated, thick, rugose* or *rugoso-crenate; paraphyses crowded.*

On trees.

SYN :—*horiza*, Ach. L. U. 394. p. p. (1810.) Syn. 157. Nyl. Scand. 160. Stizb. l. c.
EXS :—Anzi Ven. 38. Anzi It. S. 188. 189. Mudd 112.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...10...15...(19—30.)
ENGLAND :—Oswestry ! *Rev. T. Salwey.* Cliffrigg ! Cleveland. *Mr. Mudd.* Aymestrey ! Herefordshire.
SCOTLAND :—Balthayock Woods ! Perth. *Dr. Lindsay.*
IRELAND :—Common. *Mr. Carroll.*
"Spores .010—18 mm. long, .007—.010 mm. broad." (*Nyl.*)

Forma *argentata*, Ach. whitish, thin, *sublævigate* or slightly rugoso-unequal *(on rocks granuloso or areolato-verrucose);* apothecia plane or convex, fuscous or fusco-pallescent, *margin entire; paraphyses free.*

On trees and rocks. 1793.

SYN :—Ach. L. U. 393. (1810.) Syn. 157. *glabrata*, Ach. l. c. on rocks *campestris*, Schær. En. 75. Nyl. Scan. 160. Stizb. l. c.
FIG :—Hepp Sporen t. 8. f. 63. E. Bot. 450.
EXS :—Maudon 3. 54. Anzi It. S. 185. Fellman 125. 126. M. & N. 740. Schær. 609. Lindig 154. Anzi It. S. 191. 192. Anzi Ven. 36. 40. Hepp 63. Nyl. Pyr. Or. 32.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1 3...5, 6,...10...15...19...26...30.
ENGLAND :—Yorkshire, common. *Mr. Mudd.* Ludlow, Shropshire. *Dr. Babington* Chudleigh Woods; Dartmouth; Stoke Wood, Devon. *Mr. Parfitt.* Kelvedon and Totham, Essex. *Mr. Varenne.* Grove Lane, Cirencester. *Mr. W. Joshua.*
SCOTLAND :—On rocks. *Mr. Dickson.* (1793.)
IRELAND :—Ardglass co. Down. *Dr. Maingay.* near Cork Harbour. *Mr. Carroll.* Kylemore Mountains ! and near Ballinahinch. *Mr. Larbalestier.*
WALES :—Capel Curig ! Fishguard Harbour ! Pembrokeshire.
"Spores .011—16 mm. long, .007—.010 mm. broad." (*Nyl.*)

Forma *intumescens*, (Rebent.) whitish, *sublimitate, very thin, smooth*, at length rimoso-areolate; *apothecia* convex, fuscous or nigro-fuscous, sometimes *livido-pruinose, margin* thick, *snow-white*, inflexed, sometimes crenulate; paraphyses crowded, thick.

On trees.

SYN :—Rebent. Fl. Neomarch 301. (1804.) Stizb. l. c.
FIG :—Hepp Sporen t. 70 f. 614.
EXS :—Anzi Langob. 102. Arn. 273. 497. Hepp 614. Rabh. 916.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Stannor Hill ! Herefordshire. (1864.)

Forma *coilocarpa*, Ach. whitish, sublimitate or limitate, *thin, unequal or granulato-rugose* (on rocks thicker, verrucoso-diffract); *apothecia* small when young, concave, *fuscous-black or nearly black, margin entire or sub-entire;* paraphyses free, slender.

On trees and rocks.

SYN :—Ach. L. U. 393. (1810.) Syn. 157. Nyl. Scand. 161. Stizb. l. c. *pinastri*, Schær. En. 74.
EXS :—Schær. 310. Hepp 184. Anzi It. S. 186. Wright 117. Lindig 160. Leight. 52. Larbal. 77.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...5, 6, 7...10...15...23...31,

ENGLAND :—Yorkshire, common. *Mr. Mudd.* Topsham, Exeter, *Mr. Parfitt.* Ardingley rocks, Sussex. *Mr. W. Joshua.* Nescliffe Hill! Loppington! Haughmond Hill! Sharpstones Hill! Llanymynech Hill! Shropshire.
SCOTLAND :—Blaeberry Hill! Perth. *Dr. Lindsay.*
IRELAND :—Lambay Island. *Mr. Carroll.*
WALES :—Aberdovey! *Rev. A. Bloxam.* Aber! Cader Idris! between Corwen and Bala! Cwm Cywion! Castle Dinas Bran! Llanbedrog! Capel Arthog! Goodwick Bay! Pembrokeshire. Cwm Ffynnon Llugwy!
CHANNEL ISLANDS :—Boulay Bay, Rozel, La Coupe, Jersey; Eperquerie, Sark; Herm and Jethou! *Mr. Larbalestier.*
"Spores .012—18 mm. long, .008—10 mm. broad." (*Nyl.*) Spores .017 mm. long, .009 mm. broad.

Forma *gangalea*, Ach. albo-cinerascent, determinate, *radiate, thick, glabrous, rimose or rimoso-areolate;* apothecia frequent, sessile, at first concave then convex, *black, margin entire or sub-crenulate;* paraphyses sub-conglutinate.

On rocks.

SYN :—Ach. Syn. 152. (1817.) Nyl. Scand. 161. Stizb. l. c.
EXS :—Maudon 55.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...10...31.
ENGLAND :—Oswestry! Shropshire. *Rev. T. Salwey.* Airyholme Wood! Cleveland. *Mr. Mudd.* Abdon! Craigforda! Shropshire; Aymestrey! Herefordshire.
WALES :—Festiniog Road near Dolgelley! Penmaenmawr!
CHANNEL ISLANDS :—Bordeaux Harbour, Guernsey. *Mrs. Collings.*
Spores .014—.015 mm. long. .007 mm. broad.

Forma *atrynea*, Ach. *granulate* or verrucoso-areolate, sometimes nigricanti-limitate; *apothecia* moderate, plane, rarely convex, fuscous or *fusco-pallescent* or corneo-fuscescent, *margin subcrenate*, rarely entire; paraphyses thick, subconglutinate.

On rocks and posts.

SYN :—Ach. L. U. 395. (1810.) Syn. 158. Nyl. Scand. 161. Stizb. l. c.
EXS :—Fellm. 126. Rabh. 831.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...3...15...19...31.
ENGLAND :—Devon. *Mr. Parfitt.* Messing, Essex. *Mr. Varenne.*
SCOTLAND :—Cove, Kincardineshire. *Rev. J. M. Crombie.*
IRELAND :—Dinis, Killarney. *Mr. Carroll.*
CHANNEL ISLANDS :—Beauport, Jersey! *Mr. Larbalestier.*
"Spores .011—18 mm. long, .006—9 mm. broad." (*Nyl.*)

Forma *melacarpa*, Nyl. *whitish, smooth*, thin, limitate; apothecia *black*, plane, *prominent, margin white entire.*

On micaceous stone walls, rare. 1870.

EXS :—Anzi Langob. 105.
BOT. PROV :—15.
SCOTLAND :—High up on Craig Tulloch. *Rev. J. M. Crombie.* (1870.)

Forma *epibrya*, Ach. whitish, *granuloso-or verruculoso-cinerascent; apothecia fuscous or fusco-rufescent*, plane, *margin entire*, often flexuose; paraphyses subconglutinate.

On mosses, &c.

SYN :—Ach. Prod. 79. (1798.) Syn. 155. Nyl. Scand. 161. Stizb. l. c. Mudd Man. 147.
FIG :—Hepp Sporen t. f. 185.
EXS :—Hepp 185. Schær. 311. Fellm. 124. Anzi It. S. 193. Arn. 107. Th. M. Fries 8.
GEOG. DISTRIB :—Europe.
BOT. PROV :—10...30...31.

ENGLAND :—Guisbro' Moor, Cleveland. *Mr. Mudd.*
IRELAND :—Belfast. *Prof. Dickie.*
CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier.*
"Spores .014—18 mm. long, .008—.011 mm. broad." (*Nyl.*)

Forma *chlarona*, Ach. whitish or cinerascent, *determinate, thin*, sublævigate or subrugose; *apothecia plane*, or somewhat convex, *margin sub-entire or crenulate;* paraphyses slender, sub-conglutinate.

On trees and rocks.

SYN :—*distans*, Ach. Meth. 168. (1803.) *chlarona*, L. U. 397. Syn. 158. Stinzb. l. c.
EXS :—Anzi It. S. 187. 190. Hepp 778. Rabh. 803. 727. Anzi Ven. 37. Leight. 116. Mudd 113. Maudon 2. Mass. 42. Arn. 586.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...5...10...23.
ENGLAND :—Near Stokesley! Cliffrigg! Cleveland. *Mr. Mudd.* Tilgate! *Mr. Larbalestier.* Stoke Wood, Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Redland Woods, near Dorking. *Mr. W. Joshua.* Upperton, Eastbourne. *Mr. Roper.* Toy's Hill, Kent. *Mr. Holmes.* Ley Grange near Shrewsbury! Haughmond Hill! Shelton Rough! Shropshire!
SCOTLAND :—Not uncommon. *Rev. J. M. Crombie.*
IRELAND :—Barclay's Rock. *Adm. Jones.*

Forma *spodophæoides*, Nyl. in Flora 1872.

On micaceous stone walls, rare. 1870.

BOT. PROV :—15.
SCOTLAND :—Base of Craig Tulloch. *Rev. J. M. Crombie.* (1872.)

42. *L. leucophyma*, Leight. *greyish-pink, verrucoso-squamose, squamules scattered* and distinct, plano-convex, or *hemisphærico-tuberculose*, minutely innato-granulate, (K y C—); *apothecia sessile*, nigro-fuscous, convex, thalline margin entire, tumid; spores 8, colourless, elliptico-oblong, simple; paraphyses filiform, branched above and jointed; hymenea gelatina cærulescent with iodine.

On micaceo-schistose alpine rocks, very rare. 1864.

GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Over Loch-na-Cat, Ben Lawers! *Messrs. Jones & Carroll.* (1864).
Of this fine lichen only one fertile specimen has been found. The curious isidioideo-tuberculose thallus has often a pinkish tinge.

43. *L. tenera*, Nyl. *cinereo-virescent*, thin, *unequal* or *sub-granulato-unequal*, indeterminate, rimulose, (K yellow C—); *apothecia pale, minute*, plane, *margin paler*, nearly white; spores 8, colourless, oblong or sub-bacillar, simple (or obsoletely and spuriously 1-septate); paraphyses few, rather thick, apex incrassate, or clavate; epithecium and *hypothecium colourless*; gelatina hymenea blue with iodine.

On wet maritime granitic rocks, rare. 1868.

SYN :—Nyl. in Flora 1869. p. 83. Crombie En. 70. Linn. Journ. 11. p. 483.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15...31.
SCOTLAND :—S. of the Bay of Nigg, Kincardine. *Rev. J. M. Crombie.* (1868).
CHANNEL ISLANDS :—Boulay Bay! La Moye! Jersey. *Mr. Larbalestier.*
"Spores .008—.010 mm. long, .0015—.0025 mm. broad." (*Nyl.*) "Spores .0115 mm. long, .002.—.0035 mm. broad." Spermatia oblong. Allied to, though distinct from, *L. globulosa*. Flk.

forma *explanatula*, Nyl. *granules* of thallus *depressed* or flattened and more or less dispersed.

On damp walls, very rare. 1877.

BOT. PROV :—26.
IRELAND :—Letterbeg! Connemara. *Mr. Larbalestier.* (1877).

44. *L. gangaleoides*, Nyl. *albido-cinereous, verrucoso-areolate*, (*K deep yellow C*—); apothecia *black*, moderate, crowded, plane, sessile, thalline margin white, entire.

On rocks, rare. 1876.

SYN :—Nyl. in Flora 1872. p. 358. and 1873. p. 69.
EXS :—Maudon 55.
BOT. PROV :—26.
IRELAND :—Letter Hill! Galway. *Mr. Larbalestier.* (1876).

****** *Thallus K—C—.*

45. *L. epanora*, Ach. *greenish-yellow, squamuloso-glebulose, glebulæ small*, contiguous and conglomerate or dispersed, sub-radiato-lobate, *smooth* or *citrino-sorediate;* apothecia luteo-fulvous, plane, thalline margin thick, flexuose or sub-crenate; spores 8, colourless, ellipsoid, simple; thallus K—C—.

On rocks, rare. 1836.

SYN :—Ach. Prodr. 39. (1798.) Syn. 161. Nyl. Scand. 167. *L. albo-flavida*, Tayl. Fl. Hib. 2. 260. Mudd Man. 154.
FIG :—Hepp Sporen t. 89. f. 775.
EXS :—Leight. 397. Hepp 775. Th. M. Fries. 35. Anzi Langob. 43. Arn. 539.
GEOG. DISTRIB :—Sweden, Norway, Scandinavia, Walamo, (Africa).
BOT. PROV :—7...15...19.
IRELAND :—Dunkerron. *Dr. Taylor.* (1836).
WALES :—Barmouth! *Rev. T. Salwey.* near Portmadoc!
SCOTLAND :—Glen Fender. *Rev. J. M. Crombie.*
"Spores .008—.011 mm. long, .005—7 mm. broad." (*Nyl.*) "Spores .009—.012 mm. long, .005—7 mm. broad." (*T. M. Fr.*)

46. *L. medians*, Nyl. *vitellinous-yellow* or citrine, opake, *plicato-radiate at the circumference, laciniæ* narrow, *convex, incurved* and subcrenate at the apices, *minutely granuloso-scabrous on the upper surface, in the centre* broadly *albido-cinerascent*, or with scattered citrine granules, and minutely granulose or leproso-granulose, (K—); apothecia dirty-flavescent or flavo-fuscescent, plane, thalline margin citrine, entire or crenulate; spores 8, colourless, oblongo-ellipsoid, simple.

On calcerous rocks, rare. 1871.

SYN :—Nyl. in Bull. Soc. Bot. Fr. 9. p. 262. (1862.) and 13 p. 367. (1866).
EXS :—Arn. 222. Rabh. 796.
GEOG. DISTRIB :—France.
BOT. PROV :—5.
ENGLAND :—Llanymynech Hill! Shropshire. (1871).
"Spores .011—17 mm. long, .0045—.0065 mm. broad." (*Nyl.*)

47. *L. galactina*, (Ach.) *whitish, rugulose, appressed, sub-pulverulent, lobato-crenate* in the circumference; *apothecia crowded towards the centre, livido-carneo-fuscescent, more or less albo-pruinose*, margin elevated, persistent, eventually crenulate and flexuose; spores 8, colourless, ellipsoid, simple; thallus K—C—.

On plastered walls, rocks, &c. frequent.

SYN :—Ach. Meth. 190. (1803.) Syn. 187. Nyl. Scand. 134. Nyl. in Bull. Soc. Bot. Fr. 13. p. 367.
FIG :—Hepp Sporen t. 20. f. 180.

EXS :—Nyl. 122. Hepp 180. Mudd 116.
GEOG. DISTRIB :—Sweden, Germany, Helvetia, France.
BOT. PROV :—2, 3...5, 6...8...10...15...(19—30).
ENGLAND :—Near Ayton! Cleveland. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Maidstone, Shoreham, Wrotham, Folkestone, Seven Oaks, Kent. *Mr Holmes.* Walls of Tong Priory! Shropshire.
SCOTLAND :—Near Aberdeen. *Rev. J. M. Crombie.*
IRELAND :—Common. *Mr. Carroll.*
WALES :—Fishguard Harbour! Pembrokeshire.
"Spores .003 in. long, by .00125 in. broad. Spermatia cylindrical, elegantly curved or flexuose." (*Mudd.*) "Spores .009—.010 mm. long, .005—6 mm. broad." (*Nyl.*)

Forma *dispersa*, (Pers.) *sub-crustaceous;* apothecia *dispersed*, livido-pallescent or subcarneous or nigrescent, *pruinose, margin white, crenulate;* thallus K—C—.

On lime-rocks, frequent.

SYN :—Persoon in Ust. Ann. Bot. st. 7. p. 27. (1794.) Ach. Syn. 187. Nyl. in Bull. Soc. Bot. Franc. 13. p. 378.
FIG :—Hepp Sporen t. 8. f. 61.
EXS :—Hepp 61. Zw. 261.
GEOG. DISTRIB :—Northern Europe, France, Germany, Switzerland.
BOT. PROV :—1...5, 6...10...26...31.
ENGLAND :—Battersby Bank and Carlton Bank, Cleveland. *Mr. Mudd.* Chance's Pitch, Malvern. *Dr. Holl.* Starcross, Devon. *Mr. Parfitt.* Grove Lane, near Cirencester. *Mr. W. Joshua.*
IRELAND :—Killery Bay and Lettermore, Connemara. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
WALES :—Caswell Bay! Mumbles. Fishguard Harbour! Pembrokeshire.
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
Spores .009—.011 mm. long, .005—6 mm. broad.

Forma *livida*, (Ach.) whitish, *rimoso-areolate*, glabrous, *areolæ crenulate at the margins; apothecia* minute, crowded, *immersed*, disk plane, *livido-carneous, thalline margin entire.*

On rocks, rare.

SYN :—Ach. L. U. 375. (1810.) Syn. 170. Crombie Enum. 50.
GEOG. DISTRIB :—Europe.
BOT. PROV :—16.
SCOTLAND :—Appin. *Rev. J. M. Crombie.*

Forma *verrucosa*, Leight. thallus in white *dispersed*, convex, *verrucose* masses, in which the *apothecia* are *imbedded.*

BOT. PROV :—6.
WALES :—Bracelet Bay! Mumbles, near Swansea.

48. *L. subluta*, Nyl. *whitish*, thin, *minutely granulate*, indeterminate (K—C—); *apothecia pale yellow or luteo-sublivid*, crowded, *difformed by mutual pressure*, thalline *margin subcrenate;* spores 8, colourless, ellipsoid; paraphyses not very distinct; gelatina hymenea I blue then vinous-red.

On dry calcareous rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 232.
BOT. PROV :—26.
IRELAND :—Near Kylemore, Galway. *Mr. Larbalestier.* (1876.)
A distinct species of the stirps of *L. galactina.* Spores .010—12 mm. long, .005—6 mm. broad.

Var. *perspersa*, Nyl. thallus deficient; *apothecia distantly dispersed.*

On calcareous rocks, very rare. 1876.

SYN :—Nyl. in Flora 1876. p. 233.
BOT. PROV:—26.
IRELAND :—Near Kylemore, Galway. *Mr. Larbalestier.* (1876.)

49. *L. umbrina*, (Ehrh.) *thallus nearly obliterated, hypothallus olivaceo-fuscescent, diffuse;* apothecia fuscous or fusco-nigricant, small, *cæsio-suffused*, thalline *margin white sub-crenulate;* spores 8, colourless, ellipsoid, simple; *paraphyses articulate;* thallus K—C—.

On rocks, old wood, &c.

SYN :—Ehrhart Crypt. No. 245. (1793.) Ach. L. U. 368. Nyl. in Bull. Soc. Bot. Fr. 13. p. 369.
EXS :—Rabh. 747. 799. Anzi Langob. 318. 392. Arn. 21. Anzi It. S. 182.
GEOG. DISTRIB :—Sweden, Germany, France, Italy, Lombardy, Hungary Bavaria.
BOT. PROV. :—5...7...15, 16...24...30, 31.
ENGLAND :—Llanymynech Hill! Shropshire.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.* Cumbrae! Buteshire. *Mr. W. Galt.*
IRELAND :—Co. Down. *Adm. Jones.* Cliffs of Moher, co. Clare. *Mr. Carroll.*
WALES :—Between Llangollen and Corwen! Eglwyseg Rocks!
CHANNEL ISLANDS :—La Moye! Jersey. *Mr. Larbalestier.*
"Spores .009—.012 mm. long, .005—6 mm. broad." *(Nyl.)* Spores .013 mm. long, .006 mm. broad.

forma *crenulata*, (Dicks.) cinereous, very thin, *nearly evanescent; apothecia* minute, dispersed, plane, *fuscous-grey, margin white, persistent, crenulate;* spores 8, colourless, ellipsoid, simple; thallus K—C—.

On limestone rocks, &c. not uncommon. 1793.

SYN:—Dicks. Crypt. 3. 14. (1793.) Ach. Syn. 168. Nyl. in Bull. Soc. Bot. Fr. 13. p. 369.
EXS :—E. Bot. 930. Dicks. l. c. t. 9. f. 1. Hepp Sporen t. 8. f. 65.
FIG :—Hepp 65. Nyl. 125.
GEOG. DISTRIB :—Sweden, Finland, Switzerland, France.
BOT. PROV :—2...5, 6, 7...10, 11...(19—30).
ENGLAND :—Yorkshire. *Mr. Dickson.* (1793.) Eglestone, Durham. *Rev. J. Harriman.* Castle Eden; Fulwell; Boldon; and Cleadon; Middleton Beck; and Barnard Castle. Durham; Carham and Wark, Northumberland. *Mr. Winch.* Shingles, Eastbourne. *Mr. Roper.* High Rock! near Bridgnorth, Shropshire.
SCOTLAND :—Frequent. *Rev. J. M. Crombie.*
IRELAND :—Not uncommon. *Mr. Carroll.*
WALES :—Eglwyseg Rocks! Giltar Point! Tenby.

forma *prosechoides*, Nyl. *dirty-yellowish-white, tartareous, thin,* sub-determinate, *rimoso-areolate, areolæ flat or slightly tumid and smooth; apothecia* scattered, sessile, plane, *brownish-black;* thalline *margin entire;* thallus K—C—.

On maritime rocks, rare. 1856.

SYN :—Nyl. in Crombie En. 51. (1870.)
EXS :—Crombie 67.
GEOG. DISTRIB :—Europe.
BOT. PROV :—6, 7...15.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.*
WALES :—Southerndown! Glamorganshire. *Dr. Holl.* Barmouth! (1856.) Manorbeer near Tenby! Y Fegle fawr! near Barmouth. Black Rock! near Criccieth.
Spores .012 mm. long. .006 mm. broad.

forma *zosteræ*, Ach. *glaucous, effuse,* very thin, almost evanescent; *apothecia* minute, *scattered or aggregate,* plane, *rufescent,*

thalline *margin* thin, *white*, *pulverulent*; spores much smaller; paraphyses very delicate and slender.

On dry grass, &c. in maritime places. 1873.

SYN :—Ach. Syn. 158. Nyl. Scand. 160.
BOT. PROV :—31.
CHANNEL ISLANDS :—La Moye! Jersey. *Mr. Larbalestier.* (1873)
"Spores .011– 14 mm. long, .006– 7 mm. broad." (*Nyl.*)

50. *L. Hageni*, (Ach.) *albo-cinerascent*, *thin*, *indeterminate*, nearly evanescent; *apothecia* small, *crowded*, plane, at length tumid, *paler or darker brown*, *more or less pruinose*; *margin white*, persistent, *crenulate*; spores 8, colourless, ellipsoid, simple; thallus K—C—.

On trees and old wood.

SYN :—Ach. Prodr. 57. (1798.) Syn. 167. Crombie EE. 51.
FIG :—Hepp Sporen t. 8. f. 64.
EXS :—Anzi It. S. 181. Zw. 65. Hepp 64. M. & N. 1053.
GEOG. DISTRIB :—Italy, Westphalia, Germany, Helvetia, Hungary, Prussia.
BOT. PROV :—3...10, 11...15 . 24...31.
ENGLAND :—Yorkshire. *Mr. Mudd.* Teesdale, Durham. *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.*
IRELAND :—Near Limerick. *Mr. Carroll.*
CHANNEL ISLANDS :—St. Clement's Bay! and near St. Aubins! Jersey. *Mr. Larbalestier.*
Mr. Crombie finds a state designated by Dr. Nylander in litt. *sub-distans* on maritime granitic rocks at Nigg, Portlethen, Kincardineshire; and also var. *conferta*, Dub. (Bot. Gall. 654) Woodside near Aberdeen. "thallus thin, greenish or evanescent, paraphyses scarcely discrete."

forma *calcigena*, Nyl. *cinerascent*, *thickish*, crustaceous, *areolato-diffract*; *apothecia livid*, subpruinose, margin white, *entire*.

On rocks, very rare. 1876.

BOT. PROV :—26.
IRELAND :—Lettermore, Galway. *Mr Larbalestier.* (1876).

51. *L. calcarea*, (Linn.) *white or cretaceous or farinose*, contiguous, or *rimoso-areolate*, effigurate at the circumference, hypothallus pale; *apothecia immersed*, plane, *cæsio-pruinose*; spores 2, 3, 5, 6, rarely 8, colourless, ellipsoid, simple; hypothecium colourless; paraphyses gelatinoso-concrete; *medulla I—*, *thallus K—C—*; gelatina hymenea at first pale blue then dirty yellow with I; spermatia acicular straight.

On calcareous rocks, frequent.

forma *concreta*, Schær. white or cretaceous, *rimoso-areolate* or *contiguous*; apothecia immersed.

SYN :—Linn. Sp. Pl. ed. 1. No. 6. (1753.) Ach. Syn. 143. Nyl. Scand. 154. Th. M. Fries Lich. Scand. 274.
FIG :—Ach. Meth. t. 4. f. 1. Hepp Sporen t. 71. f. 627.
EXS :—Mudd 133. Leight. 13. Rabh. 323. 842. Mass. 266 A. & B. Hepp 627 Nyl. Paris. 126. Schær. 476. Anzi It. Sup. 209.
GEOG. DISTRIB :—Germany, Switzerland, Italy, Pyrenees, France, Hungary.
BOT. PROV :—5...7...10...15 . 20...26.
ENGLAND :—Bilsdale! Yorkshire. *Mr. Mudd.* Hythe, Sandgate, Penshurst; Brastead, Kent. *Mr. Holmes.* Llanymynech Rock! Shropshire.
SCOTLAND :—Killin; Appin; Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—Blarney, Cork. *Mr. Carroll.* Bridge at Maam! Joyce country. *Mr. Larbalestier.*
WALES :—Great Orme's Head! Eglwyseg Rocks! Cader Idris! Beaumaris!
Spores .029—.031 mm. long, .015—.020 mm. broad.

forma *contorta*, Hoffm. *white* or *cinerascent*, arcolæ *dispersed, centrally elevated, depressed* at the *edges;* apothecia immersed.

On calcareous rocks, frequent.

SYN :—Hoffm. Pl. Lich. 1. 97. (1790.) Th. M. Fries Lich. Scand. 275.
FIG :—Hoffm. Pl. Lich. t. 22. f. 3.
EXS :—Mudd 134. Leight. 322. Anzi It. S. 210.
GEOG. DISTRIB :—Italy, Scandinavia.
BOT. PROV :—5...7...10...26.
ENGLAND :—Roseberry! Yorkshire. *Mr. Mudd.* High Rock! Bridgnorth, Shropshire.
IRELAND :—Twelve Pins! Doughruagh! Connemara. *Mr. Larbalestier.*
WALES :—Great Orme's Head!

forma *Hoffmanni*, (Ach.) *glaucescent, areolæ sub-contiguous, apothecia larger and more elevated.*

On granite and other hard rocks, frequent.

SYN :—Ach. Meth. 145. (1803.) Syn. 143. Nyl. Scand. 154. Th. M. Fries L. Scand. 275.
FIG :—Hoffm. Pl. L. t. 22. f. 1. 2. 3. Hoffm. En. t. 6. f. 3. Mass. Ric. f. 75. E. Bot. t. 1940.
EXS :—Hepp 629. Schær. 131. Anzi Langob. 324. Anzi Venet. 46. 47. Nyl. Pyr. Or. 59.
GEOG. DISTRIB :—Switzerland, Italy, Pyrenees, Sweden, Hungary.
BOT. PROV :—3, 4, 5...7...10 ..26.
ENGLAND :—Oswestry! *Rev. T. Salwey.* Malvern Hills! *Mr. Lees.* Kenilworth Castle! *Mr. Larbalestier.* Yorkshire; Sussex and Norfolk. *Sir J. E. Smith.* King's Weston Down! Bristol. *Mr. Perceval.* Aymestry! Herefordshire. Llanymynech Hill! Haughmond Hill! Shropshire.
IRELAND :—Top of Kylemore Mountains! co. Galway. *Mr. Larbalestier.*
WALES :—Bryn Maelgwyn! Llanyblodwel Rocks!

forma *ochracea*, (Schær.) cinereo-ochraceous, areolato-diffract; apothecia immersed.

On slaty rocks, rare. 1877.

SYN :—Schær. Spic. 72.
EXS :—Schær. 128. Anzi Langob. 69.
GEOG. DISTRIB :—Switzerland, Italy, Hungary.
BOT. PROV :—7.
WALES :—Moel-y-gest! near Tremadoc (1877).

52. *L. lactea*, (Mass.) *milk-white, tartareo-farinose*, contiguous, effuse; *apothecia pallido-testaceous, at length fuscescent, most minute*, at first immersed, then sessile and sub-concave; spores 8, colourless, elliptical or elliptico-oblong, simple.

On walls, rare.

SYN :—*Aspicilia*, Mass. Symm. p. 26. (1855).
GEOG. DISTRIB :—Italy.
BOT. PROV :—5.
ENGLAND :—Near Cirencester. *Mr. Joshua.*
"Spores .009—.0122 mm. long, .00244—.00366 mm. broad." (*Mass.*)

53. *L. gibbosa*, (Ach.) *cinereous or virescenti-fuscous, angulari-areolato-verrucose*, fertile ones *elevated* in the centre; hypothallus pale; *apothecia areolate, immersed*, urceolate, or emersed, concave or plane, *naked*, thalline *margin* slightly *crenulate;* spores 8, colourless, ellipsoid, simple, large; hypothecium colourless; paraphyses gelatinoso-concrete; gelatina hymenea at first slightly blue then vinoso-fulvescent with I; *medulla I—; thallus K— C—;* spermatia acicular, straight.

On granitic and hard rocks, frequent.

forma *vulgaris*, (Th. Fr.) *dirty-whitish or cinereous, thick*, tartareous, *areolato-verrucose; apothecia* more or less *emersed*, concave or plane, *ocellate*.

SYN :—Ach. Prod. 30. (1798.) Syn. 139. Nyl. Scand. 154. Th. Fr. L. Scand. 276.
FIG :—Hepp Sporen t. 71. f. 624.
EXS :—Zw. 60. Hepp 624. Schær. 125.
GEOG. DISTRIB :—Norway, Hungary, Switzerland, Pyrenees, Italy, Germany.
BOT. PROV :—5, 6...26.
ENGLAND :—Oswestry! *Rev. T. Salwey*. Lydd Beach, Kent. *Mr. Holmes*. Stannor Hill! Herefordshire.
IRELAND :—River Dawros! co. Galway. *Mr. Larbalestier*.
WALES :—Between Llangollen and Corwen! Aber! Carnarvonshire. Barmouth! Criccieth Castle rock!
"Spores .021–30 mm. long, .014–18 mm. broad." (*T. M. Fr.*) Spores .024 mm. long, .017 mm. broad.

forma *porinoidea*, Flot. dark-*virescenti-fuscous*, opake, *smooth, areolato-verrucose*, areolæ *very convex, subhemispherical; apothecia immersed*, thalline *margin coarctate*, sometimes crenulate, often paler.

SYN :—Flot. L. Siles. 128. (1849.) Körb. Syst. 163.
FIG :—E. Bot. t. 1732.
EXS :—Mudd 135. Leight. 175.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5...7...10.
ENGLAND :—Cliffrigg, Yorkshire! *Mr. Mudd*. South Downs, Sussex. *Mr. Borrer*. Haughmond Hill! Lyth Hill! Caer Caradoc! Long Mynd! Abdon Burf!
WALES :—Craig Breiddin! Montgomeryshire. Aber! Carnarvonshire.

Forma *squamata*, Flot. dark-*virescenti-fuscous*, opake, smooth, areolato-verrucose, *closely appressed, radiato-effigurate at the circumference; areolæ convex* or subhemispherical; *apothecia immersed*, thalline margin *coarctate*, often crenulate.

SYN : -Flotow L. S. Siles. 128. (1849.) Korb. Syst. 163. Th. Fries L. Scand. 276.
EXS :—Leight. 175. (in some copies.)
BOT. PROV :—5.
ENGLAND :—Caer Caradoc!
Probably only a state of *f. porinoidea* in which the circumference is developed.

forma *depressa*, Ach. *cæsio-cinerascent*, areolate, *areolæ small, depressed*, plane; *apothecia* immersed, areolato-impressed, *sub-lecideine*.

On alpine rocks, rare. 1870.

SYN :—Ach. Syn. 144. (1817.) Nyl. Scand. 153. Crombie En. 55.
GEOG. DISTRIB :—Sweden, Lapland, Norway.
BOT. PROV :—15...19.
SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie*.
IRELAND :—Dunkerron. *Dr Taylor*.

54. *L. cæsio-cinerea*, Nyl. *albido-cinereous, cæsio-cinereous*, thickish, *areolato-verrucoso-diffract* (*medulla* I—*thallus* K *dirty-fuscescent*); *apothecia immersed* in the areolæ, concave, surrounded *with a white* thalline *margin*, at length emerged and more or less prominent; spores 8, colourless, oblong, simple.

On mountain rocks, not common. 1876.

EXS :—Anzi Langob. 323.

BOT. PROV :—7...26.
IRELAND :—Borders of Lake east side of Doughruagh Mountain, Connemara, *Mr. Larbalestier* (1876.)
WALES :—Moel-y-gest !

forma *obscurata*, Fr. *olivaceo-cinerascent*. (med. I—thallus K dirty fuscescent.)

On rocks, frequent. 1854.

SYN :—Nyl. in Flora 1872. p. 364.
EXS :—Fries L. Sc. 343. Fellm. 118. Anzi It. S. 208, Anzi Langob. 72. Krbr. 246. Leight. 204.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...10.
ENGLAND :—Cliffrigg ! Yorkshire. *Mr. Mudd.* (1854.) Longmynd ! Shropshire.

55. *L. pelobotrya*, (Whlnb.) *whitish* or *livid-grey, very thick, tartareous, continuous*, rimose, smooth, *unequally raised up into large plano-convex masses* or *pulvinuli*, (medulla I— ; thallus K— C—) on which are the *apothecia* which are at first minute and *immersed, then superficial, sub-urceolate, sub-immerso-sessile*, solitary or congregate, blackish-brown, thalline *margin very thick, somewhat polished, flexuose ;* hypothecium dark-brown ; paraphyses crowded, distinct, slender ; spores 4-8, colourless, ellipsoid or oblongo-ellipsoid, simple ; gelatina hymenea I blue.

On alpine micaceo-schistose rocks, very rare. 1869.

SYN :—*Urceolaria*, Whlnb. in Ach. Meth. Suppl. 31. (1803.) Ach. L. U. 333. Syn. 138. *Lichen*, Whlnb. Fl. Lapp. 413. *Lecanora*, Smrf. Lapp. 99. Nyl. Scand. 155.
GEOG. DISTRIB :—Finmark, Norway.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers ! *Messrs. Jones & Crombie.*
Th. Fries L. Scand. 279. ranks this in the Aspicilia section of Lecanora on account of the thick thalline margin of the apothecia being filled with gonidia. He states also that scabrous rufescent cephalodia are mingled with the areolæ of the thallus as in *Lecidea panæola*, which this lichen resembles in habit. "Spores .023—35 mm. long, .012—16 mm. broad." (*Nyl.*) "Spores .024—35 mm. long, .012—16 mm. broad." *(T. M. Fr.)*

56. *L. flavida*, Hepp. *pallido-ochraceous or cinerascent, subleprose*, effuse, very thin, rimoso-areolate ; apothecia *excessively minute*, numerous, *innate, black*, concave or plane, thalline margin thin entire ; hypothecium colourless ; paraphyses gelatinoso-concrete, *cærulescent* towards the apices ; spores 8, colourless, ellipsoid, simple ; gelatina hymenea I of an *intense persistent blue*, spores and contents of asci fulvescent ; (medulla I—, thallus K—C—.)

On moist mountain rocks, not common.

SYN :—Hepp Exs. 630. (1860.) Th. Fr. L. Scand. 286. *Aspicilia micrantha*, Korb. Par. 102. *A. ochracea*, Mudd Brit. Lich. 163.
FIG :—Hepp Sporen t. 71. f. 630.
EXS :—Hepp 630. Leight. 292. Mudd 136. Arn. 322. 322b. and 454.
GEOG. DISTRIB :—Scandinavia, Germany.
BOT. PROV :—5...10.
ENGLAND :—Cockshaw Bank ! Broughton Bank, Yorkshire. *Mr. Mudd.* Wenlock ! Shropshire.
"Spores .012—18 mm. long, .007—11 mm. broad." (*T. M. Fr.*) Spores .017 mm. long, .009 mm. broad.

57. *L. lacustris*, With. *pale* or *testaceous* or *ochraceous, thin*,

subdeterminate, plane, smooth, *slightly rimoso-areolate; apothecia minute, pallido-rufescent, urceolato-innate;* hypothecium colourless; spores 8, colourless, ellipsoid, simple; paraphyses conglutinate; gelatina hymenea I blue, then dark vinous-red or fulvescent; (medulla I—, thallus K—C—.)

On moist rocks over which water has flowed, not common. 1796.

SYN :—With. Arr. 4. p. 21. (1796.) Nyl. Scand. 155. Th. Fries Scand. 287. *L. Acharii*, Westr. in Ach. Prodr. p. 33. Ach. Syn. 137.

FIG :—With. l. c. t. 31. fig. 4. Ach. Prod. f. in tit. Hepp Sporen t. 71. f. 626.

EXS :—Zw. 114. Hepp 626. Arn. 590. Anzi Langob. 326.

GEOG. DISTRIB :—Germany, Sweden, Switzerland, France.

BOT. PROV :—7...15...(19—30.)

SCOTLAND :—Loch na Cat! Ben Lawers. *Dr. Holl.* Grampians, common. *Rev. J. M. Crombie.*

IRELAND :—Not rare. *Mr. Carroll.* Ballynakill! Galway; Mullaghglass! near Tully! *Mr. Larbalestier.*

WALES :—Llyn Aled. *Mr. Griffith.* (1796.) Tyn-y-groes. *Mr. Holmes.* Cwm Ffynnon-lloer! Llyn-y-Cae! Cwm Cwlyd! Harlech Castle! Trefriw Falls! Conway Falls! Llyn Gwernan! Aber Waterfall!

"Spores .014—.018 mm. long, .007—8 mm. broad." (*Nyl*) "Spores .013—018 mm. long, .006—8 mm. broad." (*T. M. Fr.*) Spores .013—015 mm. long, .007 mm. broad.

forma *punctata*, (Dicks.) *greyish-white*, thin, rimulose, nigro-limitate; apothecia *minute*, numerous, subsessile, *black*, plane, *cæsio-pruinose*, thalline margin *white*, entire.

On rocks and walls, rare. 1793.

SYN :—Dicks. Crypt. 3. 15. (1793.) Crombie En 55. *L. cyrtaspis*, Ach. L. U. 397. Syn. 137.

FIG :—E. Bot. 450.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...5...15 ..29, 30.

ENGLAND :—Ludlow, Shropshire. *Dr. Joseph Babington.* Coast of Sussex. *Rev. J. M. Crombie.*

SCOTLAND :—On rocks. *Mr. Dickson.* (1793).

IRELAND :—Northern Counties. *Adm. Jones.*

58. *L. Dicksonii*, (Ach.) *ochraceo-ferruginous*, thin, *smooth*, opake, *rimose* or *areolato-rimose*, nigro-determinate; *apothecia small, innate, concave, with thick black proper margin*, nigricant within; *hypothecium fuscous-black;* spores 8, colourless, ellipsoid, simple; (thallus K—C—.)

On rocks, frequent. 1781.

SYN :—Ach. Prodr. 76. (1798.) Nyl. Scand. 155. *L. Oederi*, Sm. *L. melanophæa*, Fr.

FIG :—E. Bot. 1117. Mass. Ric. fig. 67.

EXS :—Fellm. 120. Anzi It. S. 213. Zw. 25. Schær. 123. Arn. 142. Leight. 127.

GEOG. DISTRIB :—Sweden, E. Lapland, Germany, Norway, Tyrol Alps, Italy, Switzerland.

BOT. PROV :—5...7...10, 11...14, 15...19...26.

ENGLAND :—Middleton! Teesdale. *Mr. Robertson.* Ingleborough. *Dr. Carrington.* Lounsdale, Cleveland. *Mr. Mudd.* Wrekin! Brown Clee Hill! Long Mynd! Shropshire.

SCOTLAND :—Near Edinburgh. *Sir J. E. Smith.* (1781.) Alpine rocks! *Mr. Dickson.* Kincardine; Morrone; *Rev. J. M. Crombie.*

IRELAND :—Crogham, Killarney. *Mr. Carroll.* Mountains of Delphi! Connemara. *Mr. Larbalestier.*

WALES :—Anglesea. *Rev. Hugh Davies.* Barmouth! Moel Siabod! Crib Coch! Llyn Cwlyd! Snowdon! Bettws-y-coed! Moel-y-gest!

"Spores .011—14 mm. long, .006—8 mm. broad." *(Nyl.)* Spores .013 mm. long, .006 mm. broad.

59. *L. cinereo-rufescens*, (Ach.) *darkly-cinereous, whiter towards the circumference, areolato-verrucose, rimose*, hypothallus nigricant; *apothecia immersed, at first concave, eventually discoid, dark-rufous*, thalline *margin entire*; spores 8, colourless, ellipsoid, simple; (thallus K—C—, medulla I blue.)

On sub-alpine rocks and walls, rare.

SYN :—Ach. L. U. 677. (1810.) Syn. 141. Nyl. Scand. 154. Th. Fr. Scand. 284
FIG :—Mass. Ric. fig. 62.
EXS :—Hepp 625. Arn. 115. 436.
GEOG. DISTRIB :—Lapland.
BOT. PROV :—6, 7...15.
SCOTLAND :—Grampians. *Rev. J. M. Crombie.*
WALES :—Barmouth. *Rev. T. Salwey.* Aberystwith. *Miss Atwood.*
"Spores .016—24 mm. long, .009—.010 mm. broad." *(Nyl.)* "Spores .012—24 mm. long, .007—.010 mm. broad." *(T. M. Fr.)*

forma *diamarta*, Ach. *ochrey-red, rimoso-areolate*, sub-determinate; *apothecia immersed*, plane or slightly concave, *black*, thalline *margin flexuose, elevated.*

On alpine rocks, rare. 1870.

SYN :—Ach. Meth. 151. (1803.) Syn. 137. Nyl. Scand. 153. Crombie En. 55.
EXS :—Anzi Langob. 74.
GEOG. DISTRIB :—Norway, Russia, E. Pyrenees, Lombardy.
BOT. PROV :—15.
SCOTLAND :—Breadalbane. *Rev. J. M. Crombie*

60. *L. subcinerea*, Nyl. *cinereous*, thick, *subverrucoso-unequal, rimoso-diffract*, (K—C—); apothecia *fuscous-black, innate*, plane, surrounded by a *not very prominent thalline margin*, internally colourless; spores 8, colourless, subglobose or ellipsoid, simple; paraphyses indistinct; epithecium fuscescent; gelatina hymenea I slightly blue then vinous-red.

On Gneissic rocks, rare.

SYN :—Nyl. in Flora 1869. p. 82.
BOT. PROV :—10.
ENGLAND :—Holwick Scar, Yorkshire. *Mr. Harriman in herb. Sowerby.*
Allied to *L. cinereo-rufescens.* Spores 0.009—0.014 mm. long, 0.007—9 mm. broad.

61. *L. epulotica*, (Ach.) *pale* or *pallido-ochraceous* or whitish, thin, *rimulose* or sub-continuous; *apothecia urceolate* or *innate*, moderate, carneous or *carneo-rufescent, margin* thickish, concolorous, *circumcised* from the thallus; spores 8, colourless, elliptico-oblong, simple; (thallus K—C—.)

On calcareous rocks, not common.

SYN :—Ach. L. U. 151. (1810.) Syn. 9. *Lecidea*, Nyl. Scand. 189.
EXS :—Arn. 41. 164. Zw. 281. Anzi Langob. 77.
GEOG. DISTRIB :—Switzerland, Hungary, Lombardy, Germany.
BOT. PROV :—1, 2...7...11...15...26.
ENGLAND :—Middleton-in-Teesdale. *Rev. J. Harriman.* Boltshope Bourn, Durham. *Mr. Winch.* Torquay and near Exeter. *Mr. Parfitt.* near Ashburton, S. Devon. *Dr. Holl.*
SCOTLAND :—Ben Lawers. *Dr. Holl.* Trossachs; Killin; Ben Lawers; Craig Tulloch; The Khoil. *Rev. J. M. Crombie.*
IRELAND :—Kylemore! co. Galway. *Mr. Larbalestier.*
WALES :—Llyn Gwernan, Dolgelley. *Dr. Holl.* Nant Gwynant! Snowdon.
"Spores .018—20 mm. long, .010—11 mm. broad." *(Nyl.)* "Apotheciis rosellis"—not to be confounded with *L. lacustris*, With. Spores .0165 mm. long, .011 mm. broad.

62. *L. Prevostii*, (Fr.) *white, cinerascent or fleshy-white*, contiguous, often crustaceous; apothecia minute, *immersed in foveoli*, subrotund or variously difformed, *concave, roseo-incarnate* at length obscurate, *proper margin connivent, distinct from the thalline margin*; hypothecium colourless; paraphyses gelatinoso-concrete; spores 8, colourless, ellipsoid, simple; gelatina hymenea I blue then subvinous. (K—C—).

On calcareous rocks, not common.

SYN :—Fries L. E. 197. (1831.) Nyl. Scand. 189. T. Fr. Scand. 289.
FIG :—Leight. Ang. Lich. t. 15 f. 1.
EXS :—M. & N. 848. Mass. 330.
GEOG. DISTRIB :—Sweden, Germany, Italy, Switzerland, France.
BOT. PROV :—8...15.
ENGLAND :—Cheddar! *Mr. Borrer.*
SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.*

The minute gonidia, as well as other characters, separate this from *L. epulotica* which has enormous concatenate gonidia, four times larger, and which with *L. chrysophana*, Korb. *rhodopis*, Smrft. *odora*, Ach. *suaveolens*, Ach. and others. Th. Fries Scand. p. 273 includes in a distinct genus *Ionaspis*, Th. Fr. Spores .012—.013 mm. long, .008 mm. broad. "Spores .014—22 mm. long, .009—11 mm. broad." (*T. M. Fr.*)

63. *L. badia*, Ach. *olivaceo-fuscous* or *badio-fuscescent* or *fusco-cinerascent, shining, granulato-areolate*; *apothecia appressed*, numerous, often crowded, *badio-fuscous* or *fuscous-black*, shining, thalline margin entire or crenulate; spores 8, colourless, fusiformi-ellipsoid, simple; (thallus K—C—.)

On mountain rocks, frequent.

SYN :—Ach. Syn. 154. (1817.) Nyl. Scand. 170. Mudd Man. 144.
FIG :—Hepp Sporen t. 20. f. 181.
EXS :—Nyl. 42. Hepp 181. Fellm. 136. Anzi It. S. 167.
GEOG. DISTRIB :—Europe, generally.
BOT. PROV :—1...5...7, 8...10, 11.. 15...18...26...30, 31.
ENGLAND :—Ingleborough. *Dr. Carrington.* Battersby Moor, Ayton Moor; Kildale Moor! *Mr. Mudd.* Charnwood Forest! Bardon Hill! Leicestershire. *Rev. A. Bloxam.* near Eglestone, Durham. *Rev. J. Harriman.* Torquay, Devon, *Mr. Parfitt.* Stannor Hill! Herefordshire; Devil's Mouth! Long Mynd; Caer Caradoc! Bodbury Ring! near Church Stretton; Abdon Burf! Stiperstones! Shropshire.
SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay.* Ben Lawers; Coast of Kincardine; Cairn Turk, Braemar. *Rev. J. M. Crombie.*
IRELAND :—Near Belfast. *Mr. Templeton.* Lurgedon Mountain, co. Antrim. *Dr. Moore.* Mount Leinster, Carlow, and near Carnlough, co. Antrim. *Adm. Jones.* Doughruagh Mountain! Galway. *Mr. Larbalestier.*
WALES :—Snowdon, Llanberis ascent! Barmouth! Cader Idris! Cwm Bochlwyd! Cwm Cywion! Llyn Cwlyd! Llyn Geirionydd! Craig Aderyn!
CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*

"Spores .00225 in. long, by .0005 in. broad, t. 2. f. 50." (*Mudd.*) "Spores .009—.015 mm. long, .004—6 mm. broad." (*Nyl.*) "Spores .016—16 mm. long, .004—6 mm broad. Spermatia acicular, straight." (*T. M. Fr.*)

forma *cinerascens*, Nyl. *paler, cinerascent.*

On mountain rocks, frequent.

SYN :—Nyl. Scand. 170. (1861.)
EXS :—Anzi Etr. 18.
GEOG. DISTRIB :—Norway.
BOT. PROV :—7...15.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.*
WALES :—Cader Idris! Crib Coch! Snowdon; Aran Mowddwy!

Var. *atriseda*, Fr. *brunneo-fuscous*, granulato-areolate, *granules*

more or less *dispersed, tumid and convex; hypothallus* thin, *black; apothecia pallido-fuscescent, innato-sessile* in the granules, thalline margin thickish; spores ellipsoid, simple; (thallus K—C—.)

On mountain rocks, not common. 1869.

SYN :—Fr. L. E. 149. (1831.) Nyl. Scand. 170. T. M. Fries Scand. 267.
GEOG. DISTRIB :—Sweden, Finland.
BOT. PROV :—7.
WALES :—Dolgelley! *Dr. Holl.*
"Spores .008—12 mm. long, .006—7 mm. broad." (*Nyl.*) "Spores .003—13 mm. long, .005—7 mm. broad. Spermatia acicular, arcuato-curvate." (*T. M. Fr.*)

forma *picea*, Dicks. *pitch-black; apothecia black.*

On alpine rocks, rare. 1801.

SYN :—Dicks. Crypt. 4. 12. (1801.)
FIG —Dicks. l. c. t. 12. f. 5.
EXS :—Mudd 110.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...10...15.
ENGLAND :—Top of Roseberry! Cleveland. *Mr. Mudd.* Abdon Burf! Shropshire.
SCOTLAND :—Grampians; Morrone! *Rev. J. M. Crombie.* Ben Lawers. *Dr. Holl.*

64. *L. austera*, Nyl. *cervine* or *cervine-badious*, unequal, *rimose*, thin; *apothecia badious-brown*, somewhat large, *thalline margin badious*, somewhat shining, *flexuose*, often *subcrenate and proliferous*; spores 8, colourless, ellipsoid; paraphyses moderate, articulated; gelatina hymenea I scarcely tinged but thecæ bluish.

On weathered quartzose stones in gravelly places, very rare. 1874.

SYN :—Nyl. in Flora 1874. p. 309.
BOT. PROV :—16.
SCOTLAND :—Near summit of Ben Cruachan, Argyleshire. *Rev. J. M. Crombie.* (1874.)
"Spores 0.009 mm. long, 0.007 mm. broad. Spermatia 0.004—5 mm. long, not 0.001 mm broad." (*Nyl.*)

65. *L. rhyparizа*, Nyl. pale or lurido-cinerascent, granulose or granuloso-squamulose, squamulæ sublobulato-concrescent or sub-dispersed; apothecia fuscous, plane; spores 8, colourless, oblong or cylindraceo-oblong, simple, .021—27 mm. long, .006—7 mm. broad.

Forma *curvescens*, Mudd. *fuscous-black, minutely granuloso-squamulose; apothecia elevato-sessile*, margin paler, smooth, inflexed; *spores* 6-8, *obtusely fusiform*, curved, simple; (thallus K—C—.)

On alpine mosses and rocks, rare. 1858.

SYN :—Nyl. in Ofvers V. Ak. Forh. 1860. p. 296, Scand. 169. Mudd Man 125. Crombie En. 53.
FIG :—Mudd Man. t. 2. f. 38.
GEOG. DISTRIB :—Norway.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers! *Adm. Jones.* (1858.)
"Spores .008 to .01 in. long, by .001 in. broad, t. 2. f. 38." (*Mudd.*)

66. *L. poliophæa*, (Whlnb.) *cinerascent* or cinereo-fuscescent, *granulate-papillate, diffract*, or papillato-verrucose, *fibrillose-hyaline and albido-radiate at the circumference;* apothecia dark-reddish-brown, plane, *thalline margin crenulate;* spores 8, colourless, ellipsoid, simple.

On maritime rocks, rare. 1821.

SYN :—Wahlenberg Fl. Lapp. 430. (1812.) Ach. Syn. 169, Nyl. Scand. 158.
FIG :—E. Bot. Suppl. 2662. f. 3. Wahl. l. c. t. 27. f. 3.
EXS :—Crombie 62.
GEOG. DISTRIB :—Norway, Finmark, Ireland.
BOT. PROV :—1. 11. 15. 30, 31.
ENGLAND :—Bamburgh and Staples Islands, Northumberland. *Mr. Robertson.* (1821.) Tol Peden Penwith, Cornwall ! *Mr. Borrer.*
SCOTLAND :—Kinnarline. *Rev. J. M. Crombie.*
IRELAND :—Barclay's rock, co. Down. *Adm. Jones.*
CHANNEL ISLANDS :—Near Le Fret, Noirmont, Jersey ! *Mr. Larbalestier.*
"Spores .007—.013 mm. long, .005—.006 mm. broad." (*Nyl.*) "Spores .008—.013 mm. long, .004—6 mm. broad." (*T. M. Fr.*)

67. *L. verrucosa*, Ach. *white*, glaucescent, *verrucose*, smooth or slightly pulverulent; *apothecia at first immersed in the thallodal verruce*, (externally like a Pertusaria,) *ultimately areolate*, rather large, *black*, slightly pruinose, *thalline margin thick, entire, inflexed;* proper margin more or less conspicuous, nigricant; hypothecium slightly fuscescent; paraphyses gelatinoso-concrete; gelatina hymenea I blue then vinous-red; spores 8, colourless, ellipsoid, simple, large; (medulla I—, thallus K—C—.)

On mosses in alpine localities, rare. 1861.

SYN :—Ach. L. U. 339. (1810.) Nyl. Scand. 156. Mudd Man. 164. Th. Fr. Scand. 273.
FIG :—Hepp Sporen t. 71. f. 133.
EXS :—Hepp 193. Tuck. 22. Anzi It S. 211. Th. M. Fr. 36, Schær. 133. Richardson 160. Crombie 73.
GEOG. DISTRIB :—E. Finmark, Bavaria, Switzerland, Italy, Hungary, Sweden, Norway, Mackenzie River, and White Mountain, North America.
BOT. PROV :—15.
SCOTLAND :—Craig Calliach and Ben Lawers. *Dr. Maingay.* (1861.) Ben Lawers. *Sir W. J. Hooker.* Craig Tulloch; above Loch-na-Cat. *Rev. J. M. Crombie.*
"Spores .008 to .01 in. long, by .005 to .007 in. broad. t. 3. f. 56." (*Mudd.*) "Spores .030—49 mm. long, .020—30 mm. broad." (*Nyl.*) "Spores .030–48 mm. long, .016–32 mm. broad." (*T. M. Fr.*)

68. *L. symmictera*, Nyl. Similar to *L. symmicta* but distinguished from *L. symmicta* (K—C orange) by different re-action K—C—.

On trees and old pales, rare. 1872.

SYN :—Nyl. in Flora 1872. p. 248. Crombie in Journ. Bot. n. s. 2. 133.
FIG :—Hepp Sporen t. 9. f. 68.
EXS :—Hepp 68.

69. *L. torquata*, (Fr.) *pale-mouse-colour*, smooth, tartareous, *rimoso-diffract, areolæ plane*, nigricanti-limitate; *apothecia fuscous, black*, sessile, *margin pale*, persistent, entire or flexuose; spores 8, colourless, lineari-oblong, simple.

On rocks, rare 1865.

SYN :—*Parmelia*, Fr. S. V. O. 284 (1825.) *Lecanora*, Nyl. Prodr. 92.

FIG :—Mass. Ric. f. 3.
EXS :—Schær. 303. Anzi Langob. 44.
GEOG. DISTRIB :—Pyrenees.
BOT. PROV :—5...31.
ENGLAND :—Leigh Wood, Clifton. *Mr Larbalestier.* (1865).
CHANNEL ISLANDS :—La Moye, Jersey! Alderney. *Mr. Larbalestier.*
Questionable if distinguishable from *Lecidea rivulosa.* Spores .011—.012 mm. long, .0045—.0055 mm. broad.

70. *L. fuscescens,* (Smrft.) *whitish or cinereous, slightly granulose*; hypothallus thin, *fusco-nigrescent*; *apothecia fuscous,* moderate, plane, margined, internally whitish; spores 8, colourless, *globular or subglobular,* simple; paraphyses distinct; gelatina hymenea I intensely blue.

On birch.

SYN :—Smrft. Lapp. p. 161. Nyl. Scand. 212.
BOT. PROV :—15.
SCOTLAND :—Base of Morrone, Braemar. *Rev. J. M. Crombie.*
Spores diam. 0.006—7 mm.

71. *L. mammillifera,* Strtn. *darkly-cinereous* or *fusco-cinereous,* minutely *areolato-diffract,* areolæ *plane,* (K—C—); apothecia *black or fuscous-black,* small, prominent, *convex, internally pallido-cinerascent, margin obtuse,* at length depressed; spores 8, colourless, ellipsoid, simple; paraphyses few, distinct, somewhat thick, apices crasso-clavate, conglutinate, fuscous; hypothecium colourless; gelatina hymenea I cærulescent then fulvescent, especially the thecæ.

On rocks, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 85. (1875.)
BOT. PROV :—15.
SCOTLAND :—Ben-y-gloe. *Dr. Stirton.* (1875.)
Spores .008—.01 mm. long, .007—.0085 mm. broad.

72. *L. melanaspis,* (Ach.) *cinereo-glaucescent, suborbicular,* adnate, areolate, *verrucoso-rugose in the centre, radiato-laciniate in the circumference,* laciniæ convex, linear, multifid (K—C—); *apothecia* adpressed, *fuscous-black* or *rufofuscous,* margin entire; spores 8, colourless, ellipsoid, simple.

On alpine rocks, rare. 1874.

SYN :—Ach. Meth. 196. (1803.) Syn. 185. Nyl. Scand. 152.
EXS :—T. M. Fries 56. Arn. 659.
GEOG. DISTRIB :—Norway, Sweden, Finland, Lapland, Alps.
BOT. PROV :—16.
SCOTLAND :—Ben Brecht, Argyleshire. *Mr. Paterson* (1874.)
"Spores .011—14 mm. long, .007—9 mm. broad." *(Nyl.)* "Spores .010—14 mm. long, .006—10 mm. broad." *(T. M. Fr.)* Spores .012—.013 mm. long, .006—.007 mm. broad.

******* *Disk of apothecia K and C red.*

73. *L. parella,* (L.) *whitish or albido-cinerascent,* granulato-rugose or verrucoso-granulate or rimoso diffract; apothecia numerous, crowded, anguloso-difformed, disk plane, dusky-testaceous, coarsely albo-granulate, often verrucose; margin thick, often radiato-crenulate; spores 6-8, colourless, ellipsoid, simple, large; (*thallus K yellow C yellow, the disk of apothecia alone becoming red.*)

On rocks, frequent.

SYN :—Linn. Mantissa, 1 p. 132. (1767.) Ach. Syn. 152. Nyl. Scand. 156. Mudd Man. 155.

FIG :—E. Bot. 727. Hepp Sporen. t. 71. f. 622.

EXS :—Maudon 56. Anzi It. S. 164. M. & N. 1145. Zw. 66. Larbal. 75.

GEOG. DISTRIB :—Europe.

BOT. PROV .—1, 2...4, 5, 6, 7...10, 11...15...18...(19—30.) 31.

ENGLAND :—Ayton. *Mr. Mudd.* Whitestone Cliff ! near Thirsk. *Mr. Baker.* Beachy Head ! *Dr. Hooker.* Durham ; Fern Islands, Northumberland. *Mr. Winch.* Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Bedfordshire. *Rev. C. Abbot.* Studley Castle, Warwickshire ; Malvern Hills. *Mr. Purton.* Ightham, Brastead, Chittingstone, Maidstone, Lydd Beach, Shoreham, Kent. *Mr. Holmes.* West Allen Carrs, Northumberland. *Rev. W. Johnson.* Guestling, Sussex ; and Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Moreton, North Bovey ; Ilsington ; Inwardleigh ; Bottor Rock, Doddiscombesleigh. Devon. *Messrs. Jones and Kingston.* Nesscliff Hill ! Bodbury Ring near Church Stretton ! Haughmond Hill ! Llanymynech Hill ! Caer Caradoc ! Craigforda ! Shropshire.

SCOTLAND :—Stennis, Orkney. *Dr Lindsay.* Long Island. *Prof. Balfour.* coast of Kincardine ; Morrone ; Craig Tulloch. *Rev. J. M. Crombie.* Isle of May, Firth of Forth. *Mr. Sadler.*

IRELAND :—Common. *Mr. Carroll.* River Dawros ! co. Galway. *Mr. Larbalestier.*

WALES :—Aberdovey ! *Rev. A. Bloxam.* Barmouth ! Diganwy near Conway ! Drwsynant ! Trefriw ! Towyn ! Fishguard ! Beaumaris ! Criccieth ! Aber !

CHANNEL ISLANDS :—Jersey ! and all the other Islands. *Mr. Larbalestier.*

"Spores .012 to .014 in. long, by .005 to .007 in. broad." *(Mudd.)* "Spores .048—88 mm. long, .025—46 mm. broad." *(Nyl. & T. M.Fr.)*

forma *pallescens*, (L.) *white, disk* of apothecia *albo-pruinose*, margin thick, *entire, smooth.*

On rocks and trees, frequent.

SYN :—Linn. Sp. Pl. ed. 1. No. 15. (1753.) Ach. Syn. 169. Nyl. Scand. 1857.

EXS :—Maud. 3. Schær. 570. Nyl. 38. Anzi Etr. 16. Larbal. 76. Leight. 8.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2...4, 5...7. .15...25...31.

ENGLAND :—Countess Weir Bridge, Devon. *Mr. Parfitt.* near Kingsbridge, S. Devon ; Ventnor, Isle of Wight. *Dr. Holl.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Llanyblodwel rocks !

SCOTLAND :—Aberfeldy ! *Dr. Holl.* Long Island. *Prof. Balfour.* Coast of Kincardine. *Rev. J. M. Crombie.*

IRELAND :—Killaloe and Mucruss. *Mr. Carroll.*

WALES :—Between Bala and Dolgelley ! Glyn ! near Capel Curig. Llanbedrog !

CHANNEL ISLANDS :—St. Lawrence, Jersey ! and all the other Islands. *Mr. Larbalestier.*

forma *tumidula*, (Pers.) whitish, *disk* of apothecia *carneo-testaceous, coarsely albo-granulate*, margin thick, entire or crenate, smooth.

On trees, not common. 1861.

SYN :—Persoon in Ust. Ann. Bot. st. 11. p. 18. Ach. Syn. 170. Mudd Man. 155.

FIG :—Hepp Sporen t. 21. f. 188.

EXS :—Hepp 188. 784. Mudd 126. Korb. 275. Anzi Langob. 100. Arn. 140. Maudon 9. Anzi It. S. 165. Schær. 317. 318. Welw. Lusit. 88. Bohl. 60. M. & N. 1146.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2, 3...7...10, 11. 12...15.

ENGLAND :—Near Easby ! near Ayton ! Cleveland. *Mr. Mudd.* Haldon ; Exmouth, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* near Shanklin, Isle of Wight. *Dr. Holl.* Lympne, Kent. *Mr. Holmes.* Foreshield, Alston, Cumberland ; West Allen Cars, Northumberland. *Rev. W. Johnson.*

SCOTLAND :—Braemar. *Rev. J. M. Crombie.*

WALES :—Trefriw ! (on sycamore) Llanbedr churchyard ! Llanyblodwel !

forma *Turneri*, (Sm.) *albo-sorediate*; *margin* of apothecia thick, entire, *albo-pulverulent or sorediose.*

On trees, not common. 1801.

SYN :—Smith in E. Bot. 857. (1801.) Ach. Syn. 170. Mudd Man. 155.
FIG :—E. Bot. 857.
EXS :—Mudd 127. Leight. 237.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3...10, 11...15...19...25.
ENGLAND :—Near Ayton! Newton Wood; Airyholme! Cleveland. *Mr. Mudd.* Northumberland and Durham *Mr. Winch.* Kelvedon, Essex. *Mr. Varenne.* near Shanklin; near Totness. *Dr. Holl.* near Exeter. *Rev. J. M. Crombie.* West Allen Carrs, Northumberland. *Rev. W. Johnson.* Hawkhurst, Tunbridge Wells. *Mr. Jenner.* Halstead, Kent. *Mr. Holmes.*
SCOTLAND :—Castleton of Braemar. *Rev. J. M. Crombie.*
IRELAND :—Muckruss demesne. *Adm. Jones.* Deer Park, Castlemartyr; Killarney. *Mr. Carroll.*

74. *L. poriniformis*, Nyl. *cinereous* or pallido-cinereous, firm, thin, *rimoso-diffract; apothecia* 1-3-4, *innate in convex verrucæ*, (externally like a Pertusaria) *disk pale, punctiformi-contracted*; spores 6-8, colourless, ellipsoid, simple; (K yellow C the verrucæ and disk brownish-red.)

On micaceous-schistose mountain-rocks, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 353. Crombie En. 56.
EXS :—Crombie 74.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers! *Adm. Jones.* (1865.) Portlethen! Kincardine. Craig Tulloch. *Rev. J. M. Crombie.*
"Spores .070–80 mm. long, .034—50 mm. broad." *(Nyl.)*

75. *L. rupestris*, (Scop.) *whitish* or dark-cinereous, thin and effuse, or tartareous, *furfuraceous*, rimuloso-areolate; *apothecia dull-orange*, immersed, plane and margined, or emersed, convex, immarginate; spores 8, colourless, ellipsoideo-oblong, simple; (apothecia K red.)

On calcareous rocks, common.

forma *incrustans*, (DC.) *white, thin*, effuse; apothecia *small, immersed, plane, margined.*

SYN :—De Candolle Fl. Fr. 2. 361. (1805.) Schær. En. 146.
FIG :—Hepp Sporen t. 31. f. 274.
EXS :—M. & N. 944. upper spec. Schær. 220. Mass. 320.
GEOG. DISTRIB :—Europe, N. Zealand.
BOT. PROV :—1...5...10.
ENGLAND :—Yorkshire! *Mr. G. Dixon.* Chudleigh Rocks; Ansteys Cove, Torquay. *Mr. Parfitt.* Whitecliffe Rocks! Ludlow.

forma *calva*, (Dicks.) *white, thin, effuse;* apothecia *large, emersed, convex, immarginate.*

On calcareous rocks, frequent. 1790,

SYN :—Dickson Crypt. 2. 18. (1790.) Ach. Syn. 39. Nyl. Scand. 147. Mudd Man. 194.
FIG :—E. Bot. 948. Dicks. Cr. t. 6. f. 4. Hepp Sporen t. 16. f. 134.
EXS :—Schær. 221. Hepp 134. Mass. 321. M. & N. 944. lower central spec.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...5 ..7...15...19...26.
ENGLAND :—Craig-y-Rhiw, Oswestry! *Rev. T. Salwey.* Shotover Hill, Oxford. *Mr. Baxter.* Oversley Green Bridge; Coughton Court, Warwickshire. *Mr. Purton.* Whitecliffe Rocks! Ludlow! Llanymynech Hill! Downton Castle woods! Shropshire.

SCOTLAND :—Highlands. *Mr. Dickson.* (1790.)
IRELAND :—Cork ! *Mr. Carroll.* Ballynakill ! Galway. *Mr. Larbalestier.*
WALES :—Great Orme's Head ! Eglwyseg rocks !

forma *rufescens*, (Hffm.) *nigricanti-cinereous, tartareous, furfuraceous, rimuloso-areolate*; apothecia large, *convex, immarginate.*

On calcareous rocks.

SYN :—Hoffm. Pl. Lich. 1. 80. (1790.) Schær. En. 146.
EXS :—Hepp 7. Mass 322. Mudd 161. M. & N. 944. right and left spec.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...5...10...26.
ENGLAND :—Carlton ! Newton Wood ! Cleveland. *Mr. Mudd.* Holywell, Eastbourne. *Mr. Roper.* Wenlock ! Steeraway lime rocks ! Shropshire.
IRELAND :—Old bridge near Kylemore ! Galway. *Mr. Larbalestier.*

forma *viridi-flavescens*, (Wulf.) *albido-cinereous*, tartareous, *rimuloso-areolate;* apothecia large or small, *yellowish or orange, sub-innate or emersed, immarginate.*

SYN :—Wulf. in Jacq. Coll. 3. 101. (1789.) Schær. En. 146. Mudd Man. 194.
FIG :—Jacq. Coll. 3. t. 2. f. 1. Hepp Sporen t. 31. f. 275.
EXS :—Leight. 119.
GEOG. DISTRIB : - Europe.
BOT. PROV :—5...10...19.
ENGLAND : —Yorkshire. *Mr. Mudd.* Shoreham, Folkestone, Kent. *Mr. Holmes.* Whitecliff rocks near Ludlow !
IRELAND :—Whitepoint, Cork. *Mr. Carroll.*

******** *Disk of apothecium C yellow.*

76. *L. glaucoma*, (Hffm.) whitish or glaucous-white, *rimoso-areolate; apothecia livid or livido-nigricant, innate or subsessile*, plane or convex, *cæsio-pruinose*, thalline margin thin or tumid, entire, flexuose, or obliterated; spores 8, colourless, ellipsoid, simple; *disk of apothecium C yellow, thallus K yellow.*

On rocks, frequent.

SYN :—Hoffm. Fl. G. 172. (1795.) Ach. Syn. 165. Nyl. Scand. 159. Mudd Man. 153.
FIG :—E. Bot. 2156.
EXS :—Schær. 304. Mudd 122. Dicks. 22. Zw. 72. Korb. 217. Anzi It. S. 196. A. C. M. & N. 547. Leight. 53.
GEOG. DISTRIB :—Pyrenees ! Switzerland ! Italy ! S. W. Germany ! Silesia ! Vosges ! Tyrol Alps !
BOT. PROV :—1...5, 6, 7...10, 11...15...(19—30)...31.
ENGLAND :—Cliffrigg ! Cleveland. *Mr. Mudd.* Bolt Head ! S. Devon. *Dr. Holl.* Northumberland and Durham. *Mr. Winch.* Dunsford; Goodrington; Chudleigh, Devon. *Mr. Parfitt.* Whiddon Park; Penwood near Ilsington ! Widdecombe-in-the-Moor, Devon. *Messrs. Jones & Kingston.* Haughmond Hill ! Bodbury Ring ! near Church Stretton.
SCOTLAND :—Portlethen, Kincardineshire. *Rev. J. M. Crombie.*
IRELAND :—Not rare. *Mr. Carroll.*
WALES :—Anglesea. *Rev. Hugh Davies.* Aberdovey ! *Rev. A. Bloxam.* Moel-y-Golfa ! Montgomeryshire; Borth ! Cardiganshire; between Fishguard and Llanachar ! Pen Cow ! Pembrokeshire.
CHANNEL ISLNDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .003 in. long, by .00125 in. broad." *(Mudd.)* "Spores .010—13 mm. long, .006 - 7 mm. broad." *(Nyl.)* "Spores .011—14 mm. long, .006 - 7 mm. broad." *(T. M. Fr.)*

Forma *cærulata*, (Flot.) apothecia *cæruleo-nigricant, cæsio-pruinose*, plano-convex, thalline margin obliterated, *proper margin thin, black*, flexuose.

On rocks.

SYN :—Flot. L. Siles. p. 123. (1850.) Ach. Syn. 166. *lecideina*, Nyl. Prod. 88.
FIG :—Hoffm. Pl. Lich. t. 53. f. 5.
EXS :—Zw. 73. 74. Arn. 212. Anzi Langob. 67.
GEOG. DISTRIB :—Tyrol! Alps! Switzerland! Madeira! Norway! Lombardy! Arctic America!
BOT. PROV :—15.
SCOTLAND :—Highlands! *Mr. Borrer.*

Forma *cinereo-pruinosa*, apothecia *hemispherical*, disk *convex*, *carneous*, granulate, *cinereo-pruinose*, *margin obliterated.*

On rocks.

FIG :—Hepp Sporen t. 8. f. 60. and t. 103. f. 904.
EXS :—Hepp 60. 904.
GEOG. DISTRIB :—Sweden! Italy! Germany!
BOT. PROV :—10...23.
ENGLAND :—Lanbraughrigg! Cleveland. *Mr. Mudd.*
IRELAND :—Near Kinsale. *Mr. Carroll.*

Forma *Swartzii*, (Ach.) diffuse, *verrucoso-granulato-areolate*, "ambitu radioso-fimbriato"; *apothecia aggregato-conglomerate*, deformed, *cinereo-glaucous*, *pruinose*, *margin thick*, *subtumid*, *undulate.*

On alpine rocks, rare. 1801.

SYN :—Ach. Prod. 55. (1798.) Syn. 166. Nyl. Scand. 159. Dicks. Br. Crypt. 4. 23.
FIG :—Ach. N. Act. Sc. Stockh. 15. t. 6. f. 3.
EXS :—Arn. 249. Reich. & Schub. 74.
GEOG. DISTRIB :—Hungary! Bavaria!
BOT. PROV :—15.
SCOTLAND :—Highlands! *Mr. Dickson.* near Invercauld co. Aberdeen. *Mr. Brown.* (1810.) Morrone in Braemar. *Rev. J. M. Crombie.*

Forma *complanata*, Leight. thallus and apothecia *smoothed down to one uniform plane*, apothecia innate, nigricant.

On slaty rocks, rare. 1875.

BOT. PROV :—6, 7.
WALES :—Pont Dysynni! near Towyn (1875.) between Fishguard and Llanachar! Pembrokeshire.

77. *L. angulosa*, (Ach.) *cinerascent*, membranaceous, smooth, at length *unequal* or rugoso-sub-rimose; *apothecia crowded in the centre*, *subangulose*, plane or slightly convex, *pale-rufous or pale*, *slightly cæsio-pruinose*, *margin sub-entire or sub-crenulate;* paraphyses slender, sub-distinct.

On trees.

SYN :—Ach. Prodr. 54. (1793.) Syn. 166. Nyl. Scand. 161. Stizenb. l. c.
FIG :—Hepp Sporen t. 89. f. 780.
EXS :—Schær. 540. Hepp 780. Coëmans 322. Smrft. 64. Mudd 114. 115. Nyl. Pyr. Or. 19. Anzi It. S. 178. 179. Anzi Langob. 193.
GEOG. DISTRIB : –Europe.
BOT. PROV :—3...5...10...24.
ENGLAND :—Yorkshire. *Mr. Mudd.* Totham, Essex. *Mr. Varenne.* Hurst Wood, Kent. *Mr. Holmes.* Eastbourne. *Mr. Roper.* Sussex! *Mr. Borrer.* Westbury! Shropshire. *Mr. W. Phillips.* Loppington! Nesscliff Hill! Haughmond Hill! Kingsland! near Shrewsbury, Shropshire.

********* *Disk of apothecium C—.*

78. *L. sub-carnea*, (Ach.) yellowish-white, tartareous, *granulato-areolato-rimose*, *sub-radiate* at the circumference; *apothecia carneous*, plane or convex, *smooth*, *pruinose*, frequently conglom-

erato-deformed, *margin thick*, subtumid, *undulate*, in age thinner and subobliterate; spores 8, colourless, ellipsoid, simple; (*disk of apothecium C—*, thallus K yellow then orange red.)

On alpine rocks, rare.

SYN :—Ach. Meth. 59. (1803.) Syn. 45. Nyl. Scand. 159.
FIG :—Ach. N. Act. Stockh. 15. t. 6. f. 4. Hepp Sporen t. 103. f. 905.
EXS :—Nyl. 41. Zw. 75. Hepp 905. Lindig 164. Anzi Etr. 19. Mass. 309.
GEOG. DISTRIB :—Fontainebleau! Ardennes! Lozere! France! Germany! Heidelberg! Algeria! Lapland! Bogota! N. Granada, Italy!
BOT. PROV :—2...7...15...26...31.
SCOTLAND :—Morrone! Braemar. *Rev. J. M. Crombie.*
IRELAND :—Dawros Bridge! co. Galway. *Mr. Larbalestier.*
WALES :—Barmouth! Craig Dhu! near Criccieth.
CHANNEL ISLANDS :—Near Boulay Bay, Jersey! *Mr. Larbalestier.*

79. *L. albella*, (Pers.) *white*, silvery, determinate, thin, membranaceous, *smooth; apothecia* scattered, concave or plane, *pale or flesh-coloured, cæsio-pruinose* or naked, *margin entire;* paraphyses thick, free; (thallus K yellow.)

On trees, not common.

SYN :—Persoon in Ust. Ann. Bot. st. 11. p. 13. (1794.) Ach. Syn. 168. Nyl. Scand. 162. Stizb. l. c. Flora 1872. p. 365.
FIG :—E. Bot. 2154. Hepp Sporen t. 21. f. 187.
EXS :—M. & N. 1054. Schær. 315. Fellm. 127. Anzi It. S. 178. Bohl. 77.
GEOG. DISTRIB :—Sweden, Germany, France, Helvetia, America, California, Isle Bourbon, Vosges, Hungary, Arctic America.
BOT. PROV :—1, 2, 3...5...10...15...31.
ENGLAND :—Stanstead Park, Essex. *Mr. Jacob.* Ayton, Cleveland. *Mr. Mudd.* Hay Park, Herefordshire. *Rev. T. Salwey.* Sussex! *Mr. Borrer.* Ide near Exeter; Exmouth! Chudleigh, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Pophills, Warwickshire. *Rev. W. S. Rufford.* near Cirencester. *Mr. W. Joshua.* Ighham, Kent. *Mr. Holmes.* Loppington! Haughmond Hill! Shropshire.
SCOTLAND :—Aviemore. *Adm. Jones.* not uncommon. *Rev. J. M. Crombie.*
CHANNEL ISLANDS :—St. Ouen's Bay, Jersey. *Mr. Larbalestier.*
"Gelatina hymenea I blue then nearly colourless or sometimes lutescent and the thecæ vinoso-fulvescent, their apices persistent blue. Spores .009—.011 mm. long, .005—8 mm. broad." *(Nyl.)*

80. *L. peralbella*, Nyl. Similar to *L. albella*, but differs in the gelatina hymenea becoming I vinous-red.

On trees, thorns, &c., rare.

SYN :—Nyl. in Flora 1872. p. 365.
FIG :—E. Bot. 1651. ex herb. Sowerby in Brit. Mus.
EXS :—Schær. 315.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...(13—18)...26.
ENGLAND :—New Forest, Hants, *Miss Biddulph.*
SCOTLAND :—*Mr. Turner.*
IRELAND :—Killery Bay, Galway. *Mr. Larbalestier.*

### C. *Spores polari-bilocular.*

81. *L. aurantiaca*, (Lightf.) *flavescent* or *pale-lemon-colour, granulate*, rugose or unequal, rimose; apothecia *orange-coloured*, biatorine, *thalline margin* obtuse, *pale-yellow, undulate;* spores 8, colourless, ellipsoid, polari-bilocular; (thallus and apothecia K crimson.)

var. *salicina*, (Schrad.)

On ash trees. 1782.

SYN :—Lightfoot Fl. Scot. 2. 810. (1777.) Ach. Syn. 50. 175. Nyl. Scand. 142. Schrad. Spicil. 82.
FIG :—E. Bot. 1305. Hffm. Pl. L. t. 61. f. 3—9.
EXS :—M. & N. 1151. Schær. 537. Fellm. 107. Welw. Lusit. 67. Mudd 99. Anzi Venet. 27. Bohl. 118. Fries. 41. Leight. 212.
GEOG. DISTRIB :—Europe, Africa, America, Australasia.
BOT. PROV :—1, 2, 3, 4, 5...8...11...14...(19—30)...31.
ENGLAND :—Kennington. *Mr. Sowerby.* Sussex. *Mr. Borrer.* Haddiscoe, Suffolk. *Mr. Turner.* Cocken ; Castle Eden and Dalton Denes ; Gibside, Hamsterley ; Teesdale, Durham ; near Hexham and Chollerford, Northumberland. *Mr. Winch.* near Berwick. *Dr. G. Johnston.* Exminster Marshes, Devon. *Mr. Parfitt.* Gopsall Park, Leicestershire. *Rev. A. Bloxam.* Goldhanger, Essex. *Mr. Varenne.* Thame Park ! Oxfordshire. *Mr. Larbalestier.* Malvern. *Mr. W. Joshua.* Beechborough Park, near Sandgate, Halstead, Kent. *Mr. Holmes.*
SCOTLAND :—Edinburgh. *Sir. J. E. Smith.* (1782.)
IRELAND :—Frequent. *Mr. Carroll.*
CHANNEL ISLANDS :—Jersey ; Guernsey. *Mr. Larbalestier.*
"Spores .0025 to .003 in. long, by .001 to .0015 in. broad." (*Mudd.*) "Spores .012—.018 mm. long, .007—.010 mm. broad." (*Nyl.*) "Spores .013—18 mm. long, .007—.010 mm. broad." (*T. M. Fr.*) Spores .016—.019 mm. long, .009—.010 mm. broad.

Var. *erythrella*, Ach. *yellowish, thin, areolato-diffract*, or *rugose and rimose ;* apothecia dark-orange, *margin thin, obliterated ;* (thallus and apothecia K crimson.)

On rocks and earth, frequent.

SYN :—Ach. Meth. 174. (1803.) Syn. 175. Nyl. Scand. 142.
FIG :—Hffm. Pl. L. t. 20. f. 1. E. Bot. 1993. Hepp Sporen t. 22 f. 198.
EXS :—Hepp 198. Anzi It. S. 136. Mudd 100. Schær. 223. Mass. 238. 239. Zw. 94.
GEOG. DISTRIB :—Europe, America.
BOT. PROV :—1...5, 6...10...15...18, 19...26.
ENGLAND :—Bath ! *Mr. Broome.* Craig-y-Rhiw near Oswestry ! *Rev. T. Salwey.* Kildale ! Roseberry ! Cleveland. *Mr. Mudd.* Devonshire. *Mr. Parfitt.* Llanymynech Hill ! Red Hill ! Llanyblodwel rocks ! Shropshire.
SCOTLAND :—Glen Oreby about Loch Tay and elsewhere in the Highlands. *Messrs. Hooker & Borrer.* Garrynahine, Lewis ; Stennis, Orkney. *Dr. Lindsay.*
IRELAND :—Blackrock ! near Cork. *Mr. Carroll.* S. side Kylemore lake ! Glencorbol ! Galway. *Mr. Larbalestier.*
WALES :—Bishopton Glen ! Glamorganshire.
Spores .014—.015 mm. long, .008—.009 mm. broad.

Var. *inalpina*, Ach. *pale-yellowish or greenish*, very thin, *minutely areolato-rimose*, unequal, *furfuraceous ;* apothecia *orange*, margin *paler, flavescent ;* (K crimson.)

On rocks, not unfrequent.

SYN :—Ach. L. U. 388. (1810.) Syn. 179. Nyl. Scand. 142. Mudd Man. 137.
EXS :—Mudd 101.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...5...7, 8...10...15, 16...19.
ENGLAND :—Lanbraugh Rigg ! Darlington ; Yarm ; Easby ! Cleveland. *Mr. Mudd.* Kelvedon ; Messing, Essex. *Mr. Varenne.* Bredon Hill ! Leicestershire ; Middle ! Llanymynech Hill ! Shropshire.
SCOTLAND :—Western parts. *Rev. J. M. Crombie.*
IRELAND :—Whitepoint ! Cork. *Mr. Carroll.*
WALES :—Harlech Castle !

Var. *rubescens*, (Schær.) yellow or greyish-brown, *leproso-tartareous*, thin, *rimoso-diffract*, often evanescent ; apothecia small, *dark-orange-red, margin concolorous ;* (K crimson.)

On rocks, rare.

SYN :—Schær. Spic. 185. Ach. Syn. 176. Nyl. Scand. 142. Mudd Man. 138.
FIG :—Hepp Sporen t. 72. f. 636.
EXS :—Hepp 636. 637. Mass. 249. Anzi It. S. 135. Schær. 224.

GEOG. DISTRIB :—Europe.
BOT. PROV :—7...10...19.
ENGLAND :—Kildale! Cleveland. *Mr. Mudd.*
IRELAND :—Dunkerron. *Dr. Taylor.*
WALES :—Near Llangollen!
Spores .021 mm. long, .007—.009 mm. broad.

82. *L. ochracea*, (Schær.) pale-ochrey-yellow, thin, continuous or obsoletely rimoso-areolate; apothecia croceo-fulvous or orange, plane, margin entire, paler; spores 8, colourless, polari-bilocular; (thallus and apothecia K crimson.)

On limestone rocks, not common.

SYN :—*Lecidea*, Schær. in Nat. Anz. 1810. p. 11. *L. aurantiaca* var. Nyl. Prodr. 76. *L. icteriea*, Tayl!
EXS :—Schær. 222. Zw. 268. Arn. 224. Anzi It. S. 138. Mass. 114.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...3...6...8...10...19...24...28.
ENGLAND :—Torquay! Devon. *Dr. Deakin.* Malham Tarn, Yorkshire. *Mr. Hailstone.* Buxton, Derbyshire. *Rev. J. M. Crombie.* Hope near Kingsbridge, S. Devon. *Dr. Holl.* Heavitree, Exeter. *Mr. Parfitt.*
IRELAND :—Dunkerron. *Dr. Taylor.* Carrigoginmel, Limerick; Kenmare. *Mr. Carroll.* Sheep Walk, Armagh. *Adm. Jones.*
WALES :—Giltar Point! Tenby.
"Spores .002 to .0025 in. long. by .00125 to .0015 in. broad." (*Mudd.*) Spores .014—.0195 mm. long, .006—.008 mm. broad.

83. *L. ferruginea*, (Huds.) *albo-cinerascent* or *plumbeo-cinerascent*, or cæsious, thin, *smoothish*, contiguous or furfuraceous, *or crustaceous*, *granuloso* or *verruculoso-areolate*, or *evanescent*; apothecia *ferruginous-red*, *biatorine*, plane, proper margin flexuose or undulate, paler; spores 8, colourless, ellipsoid, polari-bilocular.

On trees and rocks, not uncommon. 1778.

forma *corticola*, *albo-cinerascent*, *smoothish*, contiguous or furfuraceous.

SYN :—Huds. Fl. Angl. ed. 2. p. 526. (1778.) Nyl. Scand. 143. Mudd Man. 139.
FIG :—E. Bot. 1650. (in part) Hffm. Pl. L. t. 12. f. 1.
EXS :—Zw. 95. A. Schær. 583. Mass. 221. Anzi It. S. 145. Bohl. 108. M. & N. 1055. Stenh. 137.
GEOG. DISTRIB :—Europe, Asia, Africa, America.
BOT. PROV :—1, 2, 3...5..10...13...26...31.
ENGLAND :—Sussex! *Mr. Borrer.* Ardingly, Sussex. *Mr. W. Joshua.* Bovey Tracey, Devon. *Mr. Puddicombe.* Halfpenny Hill! Yorkshire. *Mr. Baker.* Airyholme Wood! Cleveland. *Mr. Mudd.* Salcombe Hill, Sidmouth; Berry Head, Torbay; Lustleigh Cleve; Whitstone Hill, Devon. *Mr. Parfitt.* Plymouth. *Mr. Holmes.* Kelvedon; Feering; Rivenhall, Essex. *Mr. Varenne.* Malvern Hills. *Mr. Purton.* Salford Bridge, Warwickshire. *Rev. W. S. Rufford.* Haughmond Hill! Shropshire.
SCOTLAND :—Ayrshire. *Mrs. Dobie.*
IRELAND :—Glenarm Park! Blarney. *Mr. Carroll.* Kylemore lake! *Mr. Larbalestier.*
CHANNEL ISLANDS :—Jersey; Guernsey; Sark. *Mr. Larbalestier.*
Spores .014—.015 mm. long, .008 mm. broad.

forma *saxicola*, *plumbeo-cinerascent*, or cæsious, thickish, *crustaceous*, *granuloso or verrucoso-areolate*.

SYN :—Nyl. Scand. 143.
FIG :—E. Bot. 1650. (in part).
EXS :—Zw. 95. B. Mass. 225, 224. 223. Schær. 448. Mudd 102. Anzi It. S. 144. Langob. 28. Maudon 60. Fellm. 109. Leight. 85.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5, 6, 7...10...13...18...(19—26—30).

ENGLAND :—Cliffrigg! Roseberry! Cleveland. *Mr. Mudd.* Sussex. *Mr. Borrer.* Oswestry! *Rev. T. Salwey.* Hastings. *Mr. W. Joshua.* Bodbury Ring! near Church Stretton; Haughmond Hill! Shropshire. Stannor Hill! Herefordshire.

SCOTLAND :—Glasgow. *Mr. Galt.* Stennis. Orkney. *Dr. Lindsay.*

IRELAND :—Common on rocks! *Mr. Carroll.* River Dawros! co. Galway; Miderlin near Kylemore; *Mr. Larbalestier.*

WALES :—Aberdovey. *Rev. A. Bloxam.* between Bala and Dolgelley! St. David's! Pembrokeshire.

forma *festiva*, (Ach.) thallus *evanescent*, apothecia numerous. On rocks.

SYN :—Ach. Syn. 44. (1817.) Nyl. Scand. 143.
FIG :—Hepp Sporen t. 22. f. 201.
EXS :—Korb. 276. Hepp 201. Schær. 449. Anzi Langob. 272. Leight. 85.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5, 6, 7...12...15...19...26...30, 31.
ENGLAND :—Oswestry! *Rev. T. Salwey.* Starcross, Devon. *Mr. Parfitt.*
IRELAND :—Larne, co. Antrim. *Dr. Moore.* Miderlin near Kylemore and Lettermore! *Mr. Larbalestier.*
WALES :—Gimlet Rock! Pwlhelli. Y Fegle fawr! near Barmouth. Goodwick Bay! Pembrokeshire. South Stacks! Holyhead.
CHANNEL ISLANDS ;—Jersey; Guernsey; Sark. *Mr Larbalestier.*

Mr. Crombie finds on maritime rocks in Kincardineshire a var. *concilians*, Nyl. Scan. 143. Lojka 1148. "thallo cinerascente, granuloso-areolato, apotheciis ferrugineo-fuscis vel fusco-nigris, lecanorinis vel demum biatorinis." And also at Cove, Kincardineshire, and coast of Isle of Man north of Douglas! *Mr. Martindale.* another var. *fuscoatra*, (Zw. 96.) in which the apothecia have a distinct thalline margin. Mr. Carroll has also observed another state or variety *polypæna*, Ach. (Nyl. Scand. 143) "apotheciis fuscescentibus" at the upper Lake, Killarney.

forma *scotoplaca*, Nyl. *umbrino-nigricant*, smooth, thin, continuous, *rimoso-diffract*, *apothecia ochraceo-ferruginous*, *biatoroid*. Spores .009—.0011 mm. long, ·005—6 mm. broad.

On rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 232.
GEOG. DISTRIB :—France.
BOT. PROV :—26.
IRELAND :—Kylemore, Connemara. *Mr. Larbalestier.* (1876.)

84. *L. Turneriana*, Ach. *nigro-fuscous*, thickish, *areolato-rimose* or diffract, *areolæ verrucose*, rugose and unequal; *apothecia flavo-rufescent*, plane or subconvex, *margin thick*, *entire*, *persistent*, of a *paler-yellow*; spores 8, colourless, ellipsoid, polari-bilocular.

On rocks, not commou. 1876.

SYN :—*Lecidea*, Ach. L. U. p. 206 (1810.) Syn. 49.
BOT. PROV :—6...26.
IRELAND :—Killery Bay! Dawros river! Connemara. *Mr. Larbalestier.* (1876.)
WALES :—St. David's! Pembrokeshire.

85. *L. cerina*, (Ehrh.) *cinereous*, thin, unequal or granulate, hypothallus nigricanti-cærulescent; *apothecia pale-waxy-yellow*, *lecanorine*, plane, thalline *margin distinct*, *entire*, *thin*; spores 8, colourless, ellipsoid, polari-bilocular, with longitudinal channel; (K crimson.)

On trees, &c., frequent. 1793.

SYN :—Ehrhart Crypt. No. 216. (1785.) Ach. Syn. 173. Nyl. Scand. 144. Mudd Man. 135.
FIG :—E. Bot. 627. Hffm. Pl. L. t. 33. f. 1. b. Hepp Sporen t. 22 f. 203.
EXS :—M. & N. 460. Schær. 219. Hepp 203. Mudd 97. Leight. 83. Rabh. 932.
GEOG. DISTRIB :—Europe, Africa, N. America.

Bot. Prov :—1, 2, 3, 4, 5...10, 11...(19—30) ..31.
England :—Oswestry ! Shropshire. *Rev. T. Salwey.* Ayton ! Bilsdale ! Cleveland. *Mr. Mudd.* Coltishall, Norfolk. *Mr. Turner.* Lambeth. *Mr. Sowerby.* Woods on the Derwent ! near Healeyfield and about Gainford, Durham. *Mr. Winch.* Countess Weir, Exeter. *Mr. Parfitt.* Plymouth. *Mr. Holmes.* Colchester; Easthorpe ; Kelvedon; Osey Island, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* near Cirencester. *Mr. W. Joshua.* Wrotham, Brastead, Hythe, Sibertswold, Shoreham, Kent. *Mr. Holmes.* Sutton ! near Shrewsbury.
Ireland :—Common. *Mr. Carroll.*
Channel Islands :—Common on all the larger Islands. *Mr. Larbalestier.*
"Spores .0025 in. long, by .00125 in. broad." (*Mudd.*) "Spores .012—18 mm. long, .006—9 mm. broad." (*Nyl.*) Spores ".012—18 mm. long, .006—10 mm. broad." (*T. M. Fr.*) Spores .9145 mm. long, .007—.008 mm. broad.

Var. *cyanolepra*, (DC ) *cinereo-cærulescent*, hypothallus prædominating over the thin thallus.

On smooth-barked trees.

Syn :—De Candolle Fl. Franc. 2. 560. (1805.) Nyl. Scand. 144.
Fig :—Hffm. Pl. L. t. 33. f. 1. a.
Exs :—Fellm. 105. Mass. 226. Anzi Langob. 300.
Geog. Distrib :—E. Lapland, France, Italy, Switzerland, Lombardy, Scandinavia.
Bot. Prov:—5.
England :—New Forest. *Rev. J. M. Crombie.* Near Shrewsbury !

Var. *chlorina*, Fw. *verdigris-green*, *granulato-areolate*, compact' thallus and hypothallus intermingled.

On rocks, rare. 1861.

Syn :—Flotow Fl. Siles. 126. (1849.) Mudd Man. 136.
Exs: —Anzi Langob. 33. Korb. 128.
Geog. Distrib :—Germany, Silesia.
Bot. Prov :—10..26.
England :—On rocks near Newton, Cleveland. *Mr. Mudd.* (1861.)
Ireland :—Corig, Lough Corrib ! Galway. *Mr. Larbalestier.*

Var. *stillicidiorum*, (Hornem.) *albo-cinerascent*, effuse, thin, *granulate* or *leprose ; apothecia paler* or *darker*, waxy-yellow, *margin pallido-cinerascent.*

On mosses, not common. 1799.

Syn —Hornemann in Fl. Dan. t. 1063. f. 2. (1792.) Ach. Syn. 173. Nyl. Scand. 144.
Fig :—E. Bot. 1373.
Exs :—Bohl. 94. Anzi Langob. 92. Mass. 229.
Geog. Distrib :—Europe.
Bot. Prov :—1...3...7, 8...11...15.
England :—Eglestone, Durham. *Rev. J. Harriman.* (1799.) Teesdale. *Rev. J. M. Crombie.* near Buxton, Derbyshire. *Dr. Holl.* Moreton Hampstead, Dartmoor, Devon. *Mr. Parfitt.* Goldhanger, Essex. *Mr. Varenne.*
Scotland :—Castleton, Braemar. *Adm. Jones.* Morrone ; Craig Tulloch. *Rev. J. M. Crombie.* Ben Lawers. *Dr. Holl.*
Wales :—Dolgelley. *Dr. Holl.*
" Spores .016—.0165 mm. long, .008—.009 mm. broad.

Var. *fusca*, Mass. *fuscous ;* apothecia *luteo-fuscous*, thalline margin cinereous.

On trees and pales, rare. 1874.

Syn :—Mass. Sched. 130.
Exs :—Mass. 227. Mudd 97.
Geog. Distrib :—Italy.
Bot. Prov :—6, 7...10.
England :—Bilsdale ! Yorkshire ! *Mr Mudd.*
Wales :—Towyn ! (1874.) Aberdovey !
"Spores .0122 mm. long, .0061 mm. broad." (*Mass.*)

forma *cyanopolia*, Nyl. *darkly-cinereous, sometimes cæsio-cærulescent*, subleprose or *depresso-granulate* and *rimoso-diffract; apothecia pale-yellow-orange*, subconcave with an elevated cæsio-cærulescent margin, at length biatorine.

On wet stones, rare. 1877.

SYN :—Nyl. Lapp. Or. p. 128 (1866).
BOT. PROV :—26.
IRELAND :—Between Lough Feagh and Lough Muck ! *Mr. Larbalestier.* (1877.)

86. *L. pyracea*, (Ach.) *whitish* or obsolete and evanescent; apothecia red-orange, *small, biatorine, pale, margined*, at length convex, (K crimson); spores 8, colourless, ellipsoid, 1-septate or polari-bilocular with longitudinal tube.

On trees and walls.

SYN :—Ach. Meth. 176. (1803.) Syn. 49. Nyl. Scand. 145. Mudd Man. 136.
FIG :—E. Bot. 2245. Hepp Sporen t. 58. f. 500.
EXS :—Fellm. 106. Nyl. 120. M. & N. 1150. (upper specimen) Mudd 98. Hepp 500. Zw. 328. Bohl. 76. Arn. 281. Nyl. Pyr. Or. 73. Leight. 84.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5...7, 8...10, 11...13, 14...26.
ENGLAND :—Near Masham ! Ingleby ! Yorkshire. *Mr. Mudd.* Oswestry ! Shropshire. *Rev. T. Salwey.* Twycross ! Leicestershire. *Rev. A. Bloxam.* Beamish, Durham. *Mr. Winch.* Torquay ! Devon. *Dr. Deakin.*
SCOTLAND :—Southern parts. *Rev. J. M. Crombie.*
IRELAND :—Westport ! co. Mayo. *Mr. Larbalestier.*
WALES :—Llyn Aran, Cader Idris !
"Spores .002 in. long. by .001 in. broad." *(Mudd.)* "Spores .011—16 mm. long, .005—8 mm. broad." (*Nyl.*) "Spores .011—15 mm. long, .006—8 mm. broad." *(T. M. Fr.)*

Var. *ulmicola*, (DC.) apothecia *orange-yellow*, margin *paler-yellow*.

On trees, beech, not common. 1805.

SYN :—De Candolle Fl. Franc. 3. 358. (1805.) Hook. Br. Fl. 2. 186. *L. luteo-alba*, Ach. Syn. 49. Nyl. Scand. 145.
FIG :—E. Bot. 1426. Hepp Sporen t. 22. f. 202.
EXS :—Mass. 234. 232. Schær. 475. Anzi It. S. 139. 140. Hepp 202.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3, 4, 5...10...24.
ENGLAND :—Sussex. *Mr. Borrer.* Easby Wood ! Cleveland. *Mr. Mudd.* near Stoke House, Chichester ! *Mr. Cooke.* Whitstone, Exeter. *Mr. Parfitt.* Kelvedon; Coggeshall; Braxted ! Witham, Essex. *Mr. Varenne.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Holton Park, Oxfordshire. *Mr. Larbalestier.* Barnsley Park, near Cirencester. *Mr. W. Joshua.* Boxhill, Eastbourne. *Mr. Roper.* Wrotham, Hothfield, Eynsford, Shoreham, Kent. *Mr. Holmes.*
IRELAND :—Castleconnel ! near Limerick. *Mr. Carroll.* Curraghmore. *Adm. Jones.*
Spores .012—.014 mm. long, .0065—.007 mm. broad.

Var. *holocarpa*, (Ehrh.) *greyish-black*, thin, entire or scattered and furfuraceous, granulate; apothecia crowded, angular, *waxy-yellow-orange*, sub-concave or plane, *margin* entire, *paler*.

On flints and palings, not frequent.

SYN :—Ehrhart Crypt. No. 284. (1793.) Ach. Syn. 49. Nyl. Scand. 145. Mudd Man. 137.
FIG :—E. Bot. 2009. Hepp Sporen t. 9. f. 73.
EXS :—Hepp 73. Mass. 233. 235. Anzi Langob. 96.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3, 4, 5...10.
ENGLAND :—Sussex Downs. *Mr. Borrer.* Bury. *Rev. G. R. Leathes.* Ingleby !

Cleveland. *Mr. Mudd.* Bath. *Mr. Broome.* Penzance, *Rev. T. Salwey.* Anstey's Cove, Torquay. *Mr. Parfitt.* Kelvedon : Messing, Essex. *Mr. Varenne.* Grafton, Warwickshire. *Rev. W. S. Rufford.* Grinshill ! Longmynd ! Shropshire.
"Spores .010—14 mm. long, .006—.010 mm. broad." (*Nyl.*)

Var. *pyrithroma*, (Ach.) *brownish-grey*, continuous, rugulose ; *apothecia* minute, sub-immersed, concave, *pale-greenish-dun colour with a bright-yellow pruina, margin* very tumid, inflexed, *bright yellow.*

On siliceous slate.

SYN :—Ach. L. U. 206. (1810.) Syn. 39. Crombie Enum. 47. *picta*, Tayl. Fl. Hib. 2. 130.
GEOG. DISTRIB :—France, Sweden.
BOT. PROV :—11...19...26.
ENGLAND :—Durham. *Rev. J. Harriman.*
IRELAND :—Dunkerron and elsewhere in co. Kerry. *Dr. Taylor.* near Lough Inagh and Cleghan, Connemara. *Mr. Larbalestier.*

87. *L. hæmatites*, Chaub. *cinereous*, contiguous, *verruculose*, sublimitate, *hypothallus cœrulescent; apothecia dusky-ferruginous-red*, plane, sessile, *margin* somewhat thick, *cœruleo-cinerascent*, persistent ; spores 8, colourless, ellipsoid, polari-bilocular.

On trees, rare.

SYN :—Chaub. in St. Arn. Fl. Ag. 492. (1821.) Nyl. Prod. 75. Korb. Par. 64
EXS :—Coëm. 321. Zw. 263. Mass. 170. Korb. 244. Anzi Etr. 13.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Alderminster ! Worcestershire. *Mr. Lees.*

88. *L. arenaria*, (Pers.) *albo-cinerascent*, thin, *granulato-pulverulent* at the centre, *rotundato-lobate*, and crenate at the *circumference ;* apothecia sessile, plane, *dark-tawny-red, margin pale-orange-red, thalline margin white*, crenate, undulate ; spores 8, colourless, elliptico-oblong, polari-bilocular.

On rocks and walls, not frequent. 1783.

SYN :—Pers. in Ust. Ann. 7. p. 27. (1794 ) Ach. Syn. 162. *Placodium tscholytum*, Nyl. Prodr. 73. *Callopisma arenarium*, Mudd Man. 138.
FIG :—E. Bot. 1040. Hffm. Pl. L. t. 58. f. 1. Hepp Sporen t. 22. fig. 199.
EXS :—Zw. 97. Fries 348. Hepp 199. Schær. 632.
BOT. PROV. :—2, 3, 4, 5, 6, 7.
GEOG. DISTRIB :—Europe.
ENGLAND :—Strumpshaw, Norfolk. *Sir J. E. Smith.* (1783.) Wisbeach, Norfolk. *Mr. Skrimshire.* Maidstone, Kent *Adm. Jones.* near Shanklin, Isle of Wight. *Mr. Hyndman.* Fairlight near Hastings. *Dr. Holl.* Coggeshall, Essex. *Mr. Varenne.* Pophills, Warwickshire. *Rev. W. S. Rufford.* near Hereford. *Mr. W. Joshua.*
WALES :—Conway ! Fishguard Harbour ! Pembrokeshire.
"Spores .003 to .004 in. long, by .001 to .0015 in. broad." (*Mudd.*) Spores .015 mm. long, .009—.010 mm. broad.

89. *L. Lallavei*, (Clem.) *white*, tartareous, *smooth, rimoso-areolate*, sub-lobate at the circumference ; *apothecia sub-immersed*, plane, *intensely-red, scarcely margined ;* spores 8, colourless, elliptico-oblong, polari-bilocular.

On calcareous rocks, rare.

SYN :—Clem. Ess. 295. (1807.) Ach. Syn. 45. Mudd Man. 139.
FIG :—Mudd l. c. t. 2. f. 44.
EXS :—Anzi Etr. 15. Schær. 584. Mass. 45.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.

IRELAND :—Lower Glanmire road, Cork. *Mr. Carroll.*
"Spores .003 to .0035 in. long, by .0015 to .002 in. broad." *(Mudd.)* Spores .015—.017 mm. long, .0085—.009.

90. *L. epixantha*, Ach. *greenish-yellow* or greenish-grey, effuse, thin, *granulose* (K—C—); apothecia *crowded*, pale-tawny-orange, plane or sub-convex; thalline margin sub-crenulate; spores 8, colourless, oblong, polari-bilocular.

On rocks, pales, posts, and trees, not common. 1861.

SYN :—Ach. L. U. 208. (1810.) Nyl. Scand. 141. Lapp. Or. 127. *vitellinella*, Mudd Man. 135.
EXS :—Arnold 298. 491. Rabh. 798.
GEOG. DISTRIB :—Europe, Bavaria.
BOT. PROV :—2...5...19...31.
ENGLAND :—Near Worcester. *Dr. Holl.* Langley, Eastbourne ! *Mr. Roper.*
IRELAND :—Rocks and Walls near Cork. *Mr. Carroll.*
CHANNEL ISLANDS :—Vale Castle, Jersey ! *Mr. Larbalestier.*
"Spores .003 to .0035 in. long, by .001 in. broad." (*Mudd.*)

91. *L. phlogina*, (Ach.) *citrine*, effuse, *granulose*, granules dispersed, globular, leprose, (K—); *apothecia yellow-orange, waxy*, somewhat convex, *biatorine;* spores 8, colourless, elliptico-oblong, polari-bilocular.

On trees, rare. 1870.

SYN :—Ach. Meth. 180. (1803.) Nyl. Scand. 141.
FIG :—Hepp Sporen t. 44. f. 395.
EXS :—Nyl. 121. Hepp 395.
BOT. PROV :—2.
ENGLAND :—Near Hastings, Sussex. *Rev. J. M. Crombie.* (1870.)
"Spores .011—15 mm. long, .006—9 mm. broad." (*Nyl.*)

92. *L. diphyodes*, Nyl. *mouse-coloured* or *cinerascent*, thin, *rimoso-diffract*, determinate; apothecia *fusco-nigricant*, somewhat plane, prominent, imposed on the stratum gonidicum, *zeorine* (i. e, with a more or less visible double margin, proper and thalline entire) internally whitish; spores 8, colourless, *placodine, but without any axial tube;* paraphyses moderate; epithecium fuscescent, (K violet-purple); spermatia oblong, affixed to shortish arthrosterigmata.

On granitic maritime rocks, very rare. 1872.

SYN :—Nyl. in Flora 1872. p. 353. Crombie in Journ. Bot. n. s. 2. 133.
EXS :—Arn. 616.
GEOG. DISTRIB :—France.
BOT. PROV :—15.
SCOTLAND :—Near Portlethen, coast of Kincardineshire. *Rev. J. M. Crombie.* (1872.)
"Spores .012—18 mm. long, .006—8 mm. broad." *(Nyl.)*

93. *L. refellens* Nyl. *cinerascent*, thin, continuous, unequal, *everywhere clothed with minute virescent soredia* (K—C—); *apothecia pallido-rufescent*, plane, thalline margin thin subpulverulent or at length evanescent; *spores* 8, colourless, ellipsoid, polari-bilocular, with longitudinal tube; *epithecium lutescent;* paraphyses thickish; gelatina hymenea I intensely blue, especially the thecæ.

On poplar, very rare. 1876.

SYN :—Nyl. in Flora 1877. p. 458.
BOT. PROV :—26.
IRELAND :—Near Kylemore and Cleghan, Galway. *Mr. Larbalestier.* (1876.)
"A peculiar species, externally like *Lecanora Sambuci.* Apothecia sub-

biatorine, epithecium untinged with K which is the best characteristic. Spores .009—.011 mm. long, .005—7 mm. broad." *(Nyl.)* Spores .0115 mm. long, .007 mm. broad.

### D. *Spores* 1-*septate.*

94. *L. isidioides*, (Borr.) *greenish-grey* or *whitish*, *squamaceous*, stellate, *squamulæ cylindrical*, slightly compressed, isidioid, decumbent or ascending, simple or divided, here and there constricted; apothecia dull-*purplish or brownish-black*, margin tumid, crenulate, often laciniolate; spores 8, fuscescent, oblong, 1-septate.

On trees, very rare. 1835.

SYN :—Borrer in E. Bot. Suppl. 2808. (1837.) Mudd Man. 106.
FIG :—E. Bot. Suppl. 2808.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7.
WALES :—Cwm Bychan 2 m. above Llanbedr near Barmouth; Crafnant! Rhaiadr Mawddach. *Rev. T. Salwey.*
"Spores .005 to .006 in. long, by .0025 to .003 in. broad. *(Mudd.)*

95. *L. sophodes*, (Ach.) *grey or cinereo-fuscescent*, *granulate* or *granulato-areolate*, thin, sub-determinate, (K yellow C yellow) hypothallus nigricant; *apothecia fuscous-black*, plane, small, often crowded and angulose, thalline *margin entire;* spores 8, fuscous, ellipsoid, 1-septate.

On trees and rocks, not unfrequent.

SYN :—Ach. Prodr. 67. (1798.) Syn. 153. Nyl. Scand. 148.
FIG :—E. Bot. 1791. Hepp Sporen t. 9. f. 77.
EXS :—Schær. 314. Hepp 77. 78. 883. 884. Arn. 3. 109. Mudd 109. Körb. 245. Anzi Langob. 304. Stenh. 132.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...4, 5...11...15...(19—30).
ENGLAND :—Sussex. *Mr. Borrer.* Yarmouth. *Mr. Turner.* Newton-Cap Wood near Bishop Auckland, Durham; Felton Woods. Northumberland. *Mr. Winch.* Midland Counties. *Mr. Purton.* Pophills, Warwickshire. *Rev. W. S. Rufford.* New Forest, Hampshire. *Rev. J. M. Crombie.* Llanymynech Hill! Shropshire.
SCOTLAND :—(saxicole) Coast of Kincardineshire. *Rev. J. M. Crombie.*
IRELAND :—On rocks and trees, common. *Mr. Carroll.*
"Spores .011—22 mm. long, .007—.011 mm. broad." *(Nyl.)* "Spores .012—20 mm. long, .006—8 mm. broad." *(T. M. Fr.)*

forma *exigua*, (Ach.) *whitish or pallido-cinerascent*, thin, unequal or *sub-granulose*, sub-effuse; apothecia crowded, black, small, *thalline margin crenulate.*

On trees and railings.

SYN :—Ach. Prodr. 69. (1798.) Syn. 151. Nyl. Scand. 150.
FIG :—E. Bot. 1849.
EXS :—Hepp 207. 882. Zw. 257. Mass. 216. Welw. Lusit. 103.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3, 4, 5...11...15...20...31.
ENGLAND :—Sussex. *Mr. Borrer.* Yarmouth. *Mr. Turner.* Gainford, Durham. *Rev. J. Harriman.* Haldon, Devon. *Mr. Parfitt.* Kelvedon; Coggeshall, Essex. *Mr. Varenne.* Epping Forest. *Rev. J. M. Crombie.* Chelsfield, Wye, Lenham, Kent. *Mr Holmes.* Weston, near Tetsworth, Oxfordshire. *Mr. Larbalestier.* Polegate, Eastbourne. *Mr. Roper.* Brampton Brian Park! Herefordshire.
SCOTLAND :—Coast of Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Blarney near Cork. *Mr. Carroll.*
CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*
"Spores .011—18 mm. long, .006—8 mm. broad." *(Nyl.)* "Spores .014—20 mm. long, .007—11 mm. broad." *(T. M. Fr.)*

forma *lecideoides*, Nyl. *ecrustaceous*, *albido-cinerascent*, macular; *apothecia lecideine*, black, *margin brown or obliterated.*

On trees and palings.

SYN :—Nyl. Scand. 149.
FIG :—Hepp Sporen t. 10. f. 79. and 80.
EXS :—Hepp 79. 80. Mass. 237. Anzi Langob. 378. Rabh. 737. M. & N. 1331.
GEOG. DISTRIB :—Scandinavia, Italy, Germany, Hungary, Lombardy Vosges.
BOT. PROV :—5...10.
ENGLAND :—Near Stokesley! Cleveland. *Mr Mudd.* Cirencester. *Joshua*, Middleton! near Oswestry, Shropshire. *Rev. T. Salwey.*

forma *lævigata*, Ach. *cinereo-fuscescent*, smooth, *with minut. dispersed verrucæ;* apothecia scattered, nearly plane, at length papillate.

On rocks, very rare. 1877.

SYN :—Ach. L. U. 357. Syn. 153.
GEOG. DISTRIB :—Sweden.
BOT. PROV :—5...15...26.
ENGLAND :—Wapley Hill! Herefordshire.
SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.*
IRELAND :—Lettermore, Galway. *Mr. Larbalestier.* (1877.)

forma *metabolica*, Ach. *whitish* or albido-cinerascent, *disperso-areolate*, sometimes granulate; *apothecia black*, plane or convex, *thalline margin sub-entire.*

On trees and stone walls.

SYN :—Ach. L. U. 351. (1810.) Syn. 153. Nyl. Prod. 93.
EXS :—Nyl. 128. Zw. 62. A. B. Fries 341. Anzi Langob. 377. 107. Mudd 107.
GEOG. DISTRIB :—France, Lombardy, Hungary, Germany, Sweden.
BOT. PROV :—2...5, 6, 7...10...26.
ENGLAND :—Newton! Yorkshire. *Mr. Mudd.* Shanklin, Isle of Wight. *Dr. Holl.* Llanforda! Shropshire.
IRELAND :—Letter Hill! co. Galway; Kylemore Lake! *Mr. Larbalestier.*
WALES :—Festiniog Road near Dolgelley! Goodwick Bay! near Fishguard, Pembrokeshire. Rhyddlan Castle!

forma *roboris*, (Duf.) *whitish*, *continuous*, effuse, *more or less granulose;* apothecia *large*, *black*, plane, *sessile or sub-immersed*, thalline *margin lobulato-crenate.*

On trees, yew, &c.

SYN :—Nyl. Prodr. 93. (1857.) Scand. 149.
EXS :—Maudon 38.
GEOG. DISTRIB :—France, Madeira.
BOT. PROV :—1, 2...5...7 ..31.
ENGLAND :—Danny! Sussex. *Herb. Hook.* Torquay! Devon. *Dr. Deakin.* New Forest. *Rev. J. M. Crombie.* Leigh Woods, Clifton. *Mr. Larbalestier.* Llanyblodwel, Shropshire. *Rev. T. Salwey.*
WALES :—Llanrhychwyn churchyard! near Trefriw.
CHANNEL ISLANDS :—St. John's, Jersey. *Mr. Larbalestier.*

forma *malangica*, (Norm.) *dark viridi-olivaceous* or nigricant, *rimuloso-diffract*, effuse, *furfuraceous.*

On trees, rare. 1871.

SYN :—Norm. Spec. loc. 103. (1868.) T. M. Fr. Scand. 200.
GEOG. DISTRIB :—Norway.
BOT. PROV :—5.
ENGLAND :—Haughmond Hill! Pontesford Hill! Shropshire. (1871.)
"Spores .010—18 mm. long, .006—8 mm. broad." (*T. M. Fr.*)

96. *L. milvina*, (Whlnb.) *umbrino-fuscous or fuscous-black*, thickish, *granulato-areolate or areolato-diffract, verrucoso-unequal*, effuse, (K y C red); *apothecia black*, plane, crowded, margin depressed, entire; spores 8, fuscous, broadly oblong, 1-septate.

On maritime rocks, rare. 1830.

SYN:—Whlnb. in Ach. Meth. Suppl. p. 34. (1803.) Nyl. Scand. p. 150. Mudd Man. 144.

FIG:—E. Bot. Suppl. 2662. f. 1.

GEOG. DISTRIB:—Sweden, Finland, Lapland.

BOT. PROV:—1...19...26...31.

ENGLAND:—Near Penzance. *Mr. Curnow.* near Sennen, Cornwall. *Mr. Borrer.* (1830.)

IRELAND:—Carig Mountains, co. Kerry. *Dr. Taylor.* Maam Turk Mountains; River Dawros! co. Galway. *Mr. Larbalestier.*

CHANNEL ISLANDS:—Vale Castle, Guernsey. *Mr. Larbalestier.*

"Spores .0035 to .004 in. long, by .00125 to .00175 in. broad. Spermatia short, cylindrical, straight." *(Mudd.)* "Spores .015—23 mm. long, .007—.010 mm. broad." (*Nyl.*) "Spores .014—20 mm. long, .007—12 mm. broad." (*T. M. Fr.*) Spores .030 mm. long, .017 broad.

97. *L. atrocinerea*, (Dicks.) *atro-cinerascent*, granulato-or *verrucoso-areolate*, smooth, hypothallus black; *apothecia at first innate then sessile*, plane, *black*, thalline *margin sub-entire*, eventually obliterated; spores 8, fuscous, oblong, 1-septate, cells nucleolate; (thallus K yellow C red.)

On rocks. 1793.

SYN:—Dicks. Br. Crypt. 3. 14. (1793.) Nyl. Prodr. 93. Mudd Man. 144.

FIG:—Dicks. l. c. t. 9. f. 2. E. Bot. 2096. Hepp Sporen t. 73. f. 646.

EXS:—Nyl. 43. Zw. 68. A. B. 190. A. B. Hepp 646. 208. Leight. 146. Anzi Langob. 321. 45. Arn. 161. Mudd 108. Larbal. 28.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...5, 6, 7...10...15...19, 20...30, 31.

ENGLAND:—On rocks. *Mr. Dickson.* (1793.) near Ayton! Cleveland. *Mr. Mudd.* Crown Hill, Plympton, S. Devon. *Dr. Holl.* Sharpstones! Lyth Hill! Shropshire; Pembridge Churchyard! Herefordshire.

SCOTLAND:—Near Aberdeen. *Prof. Dickie.*

IRELAND:—Lough-na-Cat. *Adm. Jones.* Ardglass co. Down. *Dr. Maingay.* Pass of Kein-an-Eigh, co. Cork. *Mr. Carroll.* near Bantry. *Miss Hutchins.* Dunkerron. *Dr. Taylor.*

WALES:—Stormy Down, Glamorgan. *Dr. Holl.* Diganwy! near Conway. Fort Hill! near Fishguard, Pembrokeshire, Criccieth Castle Hill! Moel-y-gest!

CHANNEL ISLANDS;—Ninmont Hill! Beaufort Bay; La Coupe! Jersey. *Mr. Larbalestier.*

"Spores .004 in. long, by .00175 to .00225 in. broad. t. 2. f. 49." (*Mudd.*)

98. *L. coniopta*, Nyl. *dark-greyish-brown*, indeterminate, moderate, unequal, *rimoso-diffract, areolæ plane*; (thallus and white medulla K—C red), *apothecia black, innate*, at first slightly margined, at length somewhat convex and immarginate, white within; hypothecium colourless; spores 8, brownish-black, ellipsoid, 1-septate, slightly constricted; epithecium brown; paraphyses moderate, subarticulated, distinct but very compact; gelatina hymenea bluish with iodine.

On gneissic maritime rocks. 1872.

SYN:—Nyl. in Flora 1873 p. 19.

BOT. PROV:—1...15...31.

ENGLAND:—Rosemodrie Cliff near Penzance! *Mr. Curnow.*

SCOTLAND:—Portlethen! coast of Kincardineshire. *Rev. J. M. Crombie.* (1872.)

CHANNEL ISLANDS :—Near Fort Essex, Alderney! La Moye, Jersey! *Mr. Larbalestier.*

"Not unlike *Lecidea coniops* in external appearance, but a true *Lecanora.* Spermogonia black, punctate, with arthrosterigmata and slightly bacillar spermatia. "Spores .015—20 mm. long, .008—10 mm. broad." (*Nyl.*) Nearly allied to *L. atrocinerea*, Dicks., but differing in the flat plane areolæ of the differently coloured thallus. Spores .021 mm. long, .012 mm. broad.

99. *L. nivalis*, (Körb.) *whitish* or *albido-cinerascent*, very thin or *slightly granulate*; *apothecia* crowded, *ochraceous* or aurantiaco-ochraceous, *biatorine*, *plane*, small, *proper margin somewhat darker*, *thalline margin obsolete*; *spores* 8, *cylindraceo-oblong*, or cylindrical, *simple* or faintly 1-septate; apothecia K dark crimson.

On decaying moss among alpine rocks, rare. 1864.

Externally like *L. fulvolutea*, Nyl.

SYN :—*Callopisma*, Korb. S. L. G. 127. (1855.) *Lecanora fusco-luteolina*, Mudd Man. 153. *Lecanora nivalis*, Nyl. Lapp. Or. 129.
GEOG. DISTRIB :—Eastern Lapland, Greenland.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers! and Maelgrae! *Adm. Jones.* Ben Cruachan. *Rev. J. M. Crombie.*
Externally like *L. fulvolutea*, Nyl. "Spores .005 to .006 in. long, by .001 in. broad." (*Mudd.*) "Spores .028—38 mm. long, .005—7 mm. broad." (*Nyl.*) "Spores .024—38 mm. long, .005—7 mm. broad." (*T. M. Fr.*)

100. *L. Hutchinsiæ*, Nyl. *pallido-cinerascent* or flavido-cinerascent, thin, *rimose* or *rimuloso-diffract* (K—C—); *apothecia rufo-testaceous*, convex, *biatorine*; *spores* 8, colourless, *fusiform*, 1-septate; *paraphyses thick*, somewhat articulate; hypothecium colourless; gelatina hymenea cærulescent with iod.

On maritime schistose rocks, rare.

SYN :—Nylander in Flora 1867. p. 326.
GEOG. DISTRIB :—Europe.
BOT. PROV : -1...6..19...26...31.
ENGLAND :—Penzance. *Mr Curnow.*
IRELAND :—South of Ireland. *Miss Hutchins.* Kinvyle! co. Galway; Dawros Salrock! *Mr. Larbalestier.*
WALES :—Goodwick Bay! Pembrokeshire.
CHANNEL ISLANDS :—La Moye, Jersey. *Mr. Larbalestier.*
"Spores .010—12 mm. long, .0025—.0035 mm. broad. Spermatia arcuate." (*Nyl.*) Spores .013—.014 mm. long, .003—.004 mm. broad.

forma *bellissima*, Leight. apothecia *pallido-rosaceous*, slightly pruinose.

On ruined walls, very rare. 1877.

BOT. PROV :—26.
IRELAND :—Ruin at Cleghan! near Kylemore. *Mr. Larbalestier.* (1877.)

101. *L. holophæa*, (Mnt.) *cervino-castaneous* or fuscous, cartilagineo-membranaceous, *squamulose*, *squamulæ concave*, *plicato-undulate*, *rotundato-incised*, *ascending*, flexuose, pale beneath; *apothecia* erumpent, appressed, *fuscous-black*, plane, thalline margin naked, very entire; spores 8, colourless, oblongo-fusiform, 1-septate.

In the fissures of maritime rocks, rare.

SYN :—Montagne Lich. Canar. 113. (1840.) Sylloge 332. Crombie Enum. 48. *Lecidea sublurida*, Nyl. En. Sup. 337.
EXS :—Leight. 380.
GEOG. DISTRIB :—Canaries.
BOT. PROV :—1...5...19, 20...24...30, 31.

ENGLAND :—Bradstone Churchyard Wall, S. Devon. *Dr. Holl.* Start Point, Devon. Bray Hill, St. Minver, Cornwall. *Mr. Holmes.* Pulborough. *Mr. Davies.* on red sandstone, St. James, near Bridgnorth, Mytton Bach! Stiperstones, Shropshire.

IRELAND :—Ardglass, co. Down. *Dr. Maingay.* South of Ireland. *Miss Hutchins.* Island Magee and near Belfast! Brandon Mountain! *Dr. Moore.* Glengariff. *Adm. Jones.* Ballycotton! Cork; Sybil Head, Kerry! Kilkee and Ross, Clare. *Mr. Carroll.*

CHANNEL ISLANDS :—St. Martin's Point, Guernsey. *Mr. Larbalestier.*

Spores .011—.014 mm. long, .004 mm. broad.

Var. *glaucopsora*, Nyl. squamuloso-crenate, or *granulato-squamulose*, or sub leprose; apothecia *livido-fuscous, thalline margin subentire;* spores 8, colourless, fusiform, 1-septate; (thallus K very faint yellow.)

Damp sides of old turf pits, rare. 1867.

SYN :—Nylander in Flora 1868. p. 164.
EXS :—Larbal. 79.
GEOG. DISTRIB :—Europe.
BOT. PROV :—31.
CHANNEL ISLANDS :—Sark; Grosnez Common! Saint's Bay; Jersey; Alderney. *Mr. Larbalestier.*

"Spores .012—18 mm. long, .003—4 mm. broad." (*Nyl.*)

102. *L. leucospeirea*, Nyl. *white*, opake, *squamulose, squamulæ sub-crenate, thin, adnate, dispersed, often granuliform;* apothecia *fuscous*, sub-opake, plane, thalline *margin white*, entire; spores 8, colourless, oblong or ovoideo-oblong, 1-septate.

On sandy earth, rare. 1868.

SYN :—Nylander in Flora 1868. p. 473. Crombie Enum. 48.
GEOG. DISTRIB :—Europe.
BOT. PROV :—31.
CHANNEL ISLANDS :—La Moye; Boulay Bay; Jersey. *Mr. Larbalestier.*

Allied to *L. holophæa* and its var. *glaucopsora*. "Spores .011—13 mm. long, .0035 mm. broad." (*Nyl.*)

103. *L. erysibe*, (Ach.) olivaceo-cinereous or virescenti-olivaceous, or darkly cinereous, *leproso-granulose, thin, diffract; apothecia fusco-rufous* or livido-testaceous, *innate*, plane or convex, *thalline margin rather indistinct;* spores 8, colourless, linear-oblong, 1-septate.

On rocks, walls, &c. not common. 1861.

SYN :—Ach. Prod. 50. (1798.) Syn. 41. Nyl. Scand. 167. Mudd Man. 141.
FIG :—Hepp Sporen t. 9. f. 75.
EXS :—Mudd 104. 105. 106. Mass. 148. 145. 144. 146. Zw. 269. Hepp 75.
GEOG. DISTRIB :—Sweden, Italy, Germany, Switzerland.
BOT. PROV :—1, 2, 3...5, 6...10...15...19, 20...23...26...31.

ENGLAND :—Coatham! near Ayton! Redcar, Cleveland. *Mr. Mudd.* Bath! *Mr. Broome.* Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Rottingdean, near Brighton. *Mr. W. Joshua.* Abdon! Shropshire; Aymestrey! Herefordshire.

SCOTLAND :—Coast of Kincardine; Craig Guie. *Rev. J. M. Crombie.*

IRELAND :—Near Dublin. *Dr Taylor.* Co. Down. *Adm. Jones.* near Cork and near Castlemary! Turk Cascade, Killarney; Kilkee. *Mr. Carroll.* Kylemore, Galway.

WALES :—Goodwick Bay! Pembrokeshire.

CHANNEL ISLANDS :—Jerbourg, Guernsey; Noirmont! Jersey. *Mr. Larbalestier.*

"Spores .002 to .00275 in. long, by .00075 to .001 in. broad, t. 2. f. 47." (*Mudd.*) "Spores .010– 14 mm. long, .004—5 mm. broad. Gelatina hymenea I blue." (*Nyl.*) Spores .010—.011 mm. long, .004 mm. broad.

*forma sincerior, Nyl. cinerascenti-pallid* or *subochraceo-whitish*, subgranulate, areolato-rimose; apothecia *pallido-fuscescent*, lecanorine.

On maritime rocks, very rare. 1876.

SYN:—Nyl. in Flora 1876. p. 577.
GEOG. DISTRIB:—Eastern Pyrenees.
BOT. PROV:—6...26...31.
IRELAND:—Lettermore, Galway. *Mr. Larbalestier.*
WALES:—Goodwick Bay! Pembrokeshire.
CHANNEL ISLANDS;—Guernsey and La Coupe, Jersey. *Mr. Larbalestier.*

104. *L. aipopsila*, (Whlnb.) *fuscous or fusco-cinereous, subramoso-papillato-granulate* or *tuberculose*, continuous or radiato-sulcate or crenulate towards the circumference; *apothecia on the papillæ*, fuscous or fuscous-black or nigricant, plane or sub-convex, thalline margin entire, eventually excluded; *spores* 8, colourless, *ellipsoid*, 1-*septate*.

On maritime rocks, rare. 1808.

SYN:—Wahlenberg in Ach. Meth. Suppl. 36. (1803.) Ach. Syn. 155. Nyl. Scand. 157. Mudd Man. 141.
FIG:—E. Bot. Suppl. 2662. f. 2. Wahl. Fl. Lapp. t. 27. f. 2.
EXS:—Th. M. Fries 60.
GEOG. DISTRIB:—Finmark, E. Lapland.
BOT. PROV:—1...11...15...18...20.
ENGLAND:—Bamburgh and Staples Island co. Northumberland. (1831.) *Mr. Robertson.* Holy Island, Northumberland. *Mr. Winch.* Tolpednapenwith! near the Land's End: Penzance; near Mousehole Cave, Penzance! *Mr. Curnow.*
SCOTLAND:—Orkney Islands. (1808.) *Mr. Borrer.* Kincardine. *Rev. J. M. Crombie.*
IRELAND:—Kinsale. *Mr. Carroll.*
"Spores .009—.012 mm. long, .005 mm. broad. Gelatina hymenea I intense blue then dark-violet." (*Nyl.*)

forma *maritima*, (Smmrf.) *grey or griseo-nigricant*, thin, *granulato-rugose*, shortly radiose or sub-crenate at the circumference.

On maritime rocks, rare.

SYN:—Sommerfelt in Act. Ac. Holm. 1832. p. 116. Nyl. Scand, 158.
EXS:—Fellm. 122.
GEOG. DISTRIB:—E. Lapland, Norway.
BOT. PROV:—31.
CHANNEL ISLANDS:—Jerbourg, Guernsey. *Mr. Larbalestier.*

105. *L. helicopis*, (Whlnb.) *albido-cinereous*, thin, unequal, *rimuloso-areolate, albo-limitate*; *apothecia livido-fuscescent* or fuscous, plane, sub-convex, *thalline margin entire, ultimately excluded*; spores 8, colourless, ellipsoid, simple or obsoletely 1-septate; (*thallus K faint yellow, but not disk of apothecium.*)

On maritime rocks, rare.

SYN:—Wahlenberg Fl. Lapp. 414. (1812.) Ach. Syn. 149. Nyl. Scand. 159!
GEOG. DISTRIB;—Lapland, Finmark, Aland.
BOT. PROV:—6...30.
IRELAND:—On chalk, Glenarm co. Antrim. *Adm. Jones.*
WALES:—Goodwick Bay! Pembrokeshire.
The chemical reaction shows affinity with *subfusca* and not with *glaucoma*. "Spores .009—.015 mm. long, .005—6 mm. broad." (*Nyl. & T. M. Fr.*) Spores .012 mm. long, .006 mm. broad. Paraphyses distinct.

106. *L. albariella*, Nyl. dirty-creamy-whitish, tartareous, thin, areolato-diffract, areolæ plane, smoothish; *apothecia fuscous* or

fuscous-black, *small; spores* 8, *colourless, ovoid*, 1-*septate;* paraphyses distinct; gelatina hymenea cærulescent, then violaceo-rubescent with iodine solution.

On maritime chalky rocks, rare. 1864.

SYN:—Nylander Lich. Ægypt. p. 5. in Act. Soc. Linn. Bordeaux vol. 25. (1864.)
GEOG. DISTRIB:—Ægypt.
BOT. PROV:—2...30, 31.
ENGLAND:—Beachy Head, Sussex. *Mr. Larbalestier.* (1864.)
IRELAND:—On chalk at Glenarm and at Garron Point co. Antrim. *Adm. Jones.*
CHANNEL ISLANDS:—Island of Bréchou near Sark. *Mr. Larbalestier.*

107. *L. spodophœiza*, Nyl. *greyish*, moderate, *granuloso-verrucose*, thinly white-fimbriated at the extreme circumference, (K—C—); apothecia badio-reddish, somewhat plane, with subentire scarcely prominent thalline margin; epithecium faintly brownish; spores 8, colourless, oblong or fusiform-oblong, simple, or often subspuriously 1-septate.

On maritime rocks, rare. 1873.

SYN:—Nyl. in Flora 1873. p. 290.
BOT. PROV:—31.
CHANNEL ISLANDS:—Mont Orgueal Castle, Jersey! *Mr. Larbalestier.* (1873.)
"Spores .009—18 mm. long. .004—6 mm. broad. Gelatina hymenea I slightly blue then vinous-red. Similar externally to *L. poliophœa* or *spodophœa* but really belonging to the section of *L. erysibe.* Spermatia arcuate." *(Nyl.)* Paraphyses distinct but compact. Spores .0155 mm. long, .005 mm. broad.

108. *L. Ralfsii*, Salw. MS. *olive-green*, cartilagineo-tartareous, smooth, *sub-colliculoso-areolate*, sub-determinate; *apothecia pale-brown* or *reddish-brown*, minute, numerous, scattered, innato-sessile, plane, margin very thin, smooth, eventually evanescent; *hypothecium thin, pale-brown;* spores 8, colourless, elliptical-oblong or ovate, 1-septate; paraphyses lax, slender.

On maritime rocks, rare. 1860.

SYN:—*Biatorina Muddii* (Salw.), Mudd Man. 178. *Lecanora actæa*, Nyl. in Flora 1873. p. 290.
GEOG. DISTRIB:—England.
BOT. PROV:—1...31.
ENGLAND:—Near Mousehole Cave, Cornwall. *Mr. Curnow.* near Newlyn, Cornwall. *Rev. T. Salwey.* (1860.)
CHANNEL ISLANDS:—St. Aubin's Fort! Jersey. *Mr. Larbalestier.*
"Spores .003 to .0035 in long. by .001 to .0015 in. broad." (*Mudd.*) "Spores .012—14 mm. long. .00045 mm. broad." (*Nyl.*) Spores .012 mm. long, .006 mm. broad.

109. *Lecanora subexigua*, Nyl. similar to *L. exigua*, but the thallus pale-greenish, sub-smooth, unequal, rimose; spores 8, 0.012—15 mm. long, 0.006—7 mm. broad.

On maritime rocks, rare. 1874.

SYN:—Nyl. in Flora 1874. p. 308.
BOT. PROV:—1.
ENGLAND:—Near Penzance, Cornwall. *Mr. Curnow.* (1874.)

110. *L. Bischoffii*, (Hepp) *albido-cinerascent* or *fuscescent, leproso-farinose*, thin, effuse, indeterminate, (K—C—); *apothecia nigro-fuscous*, sessile, plane or slightly convex, *margin thin, cinerascent or fuscescent;* hypothecium colourless; paraphyses

distinct, apices colourless ; *spores* 8, *fuscous, broadly-oblong, large, with a broad darker central transverse band or septum.*

On calcareous rocks, probably not unfrequent. 1875.

SYN :—Hepp Exs. 81. (1853.) Korb. Par. p 75.
FIG :—Hepp Sporen t. 10. fig. 81.
EXS :—Hepp 81. Anzi Ital. S. 222.
GEOG. DISTRIB :– Switzerland, Italy, Germany, Sweden.
BOT. PROV :—1...15.
ENGLAND :–Yatton ! Somersetshire. *Mr. Joshua.* (1875.)
SCOTLAND :—Craig Tulloch, Blair Athole. *Rev. J. M. Crombie.*
Spores .022—.024 mm. long. .016—.017 mm. broad. Gelatina hymenea I dirty-blue. Well distinguished by the broad septum of the spores.

Var. *immersa*, (Krbr.) *apothecia immersed* in the rock, plane, margin fuscescent, involute.

On limestone rocks & walls. 1875.

SYN :—Korb. Par. p. 75. (1865.)
EXS :—Mass. Ital. 113. Rabh. 873.
GEOG. DISTRIB : - Germany, Italy.
BOT. PROV :—1
ENGLAND :—Yatton and Weston-super-Mare. *Mr. Joshua.* (1875.)
There is an ochraceous state of this variety (see *Mull. Arg. in Flora* 1867, *p.* 435.) which may be probably found on our limestone rocks.

111. *L. bœomma*, Nyl. *albido-lutescent*, opake, thin, unequal (K yellow) ; *apothecia pallido-rufescent*, scattered, *thalline margin white, thickish, subanguloso-difformed ;* spores 8, colourless, oblong, 1-septate, cells nucleolate ; paraphyses slender, distinct, apices pale ; gelatina hymenea I blue then vinoso-fulvescent or vinous-red.

On micaceo-schistose rocks by the sea. 1876.

SYN :—Nyl. in Flora 1876. p. 233. Flora 1877. p. 562. *L. rupicola*, Nyl. in Flora 1877. p. 228.
BOT. PROV :—26.
IRELAND :—Letterfrack ! Lettermore ! Connemara. *Mr. Larbalestier.*
"Spores .012–18 mm. long .004—6 mm. broad. similar to those of *Verrucaria epidermidis.*" *(Nyl.)* Spores .014 mm. long, .004—5 mm. broad.

112. *L. glaucocarnea*, Nyl. *glauco-virescent, rugulose or altogether subleprose, rimoso-diffract*, determinate (K yellow); *apothecia pallido-carneous or lurid, biatorine*, margin obtuse, somewhat paler and at length evanescent ; spores 8, colourless, oblong, 1-septate.

On shady micaceo-schistose rocks, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 459. Flora 1877. p. 562.
BOT. PROV :—26.
IRELAND :—Near Glendalough ! and near Lough Muck ! Galway. *Mr. Larbalestier.* (1877.)
"Probably a subspecies of *L. bœomma*, Nyl. which is rather a *Biatora* than a *Lecanora.*" *(Nyl.)* Spores .011–.0135 mm, long, .005 mm. broad.

113. *L. spadomela*, Nyl. *cinereo-fuscous*, thin, opake, *subleprose, rimoso-diffract ; apothecia nigricant, plane, thalline margin nearly entire ;* paraphyses distinct, sometimes branched at the apex, apices clavate, fuscous ; *spores* 8, *colourless*, ellipsoid or oblong, 1-*septate*,

On sandstone rocks, very rare. 1876.

SYN :—Nyl. in Flora 1876. p. 572.
BOT. PROV :—26.
IRELAND :—Killery Bay ! near Glencorbol ! Connemara. *Mr. Larbalestier.* (1876.)

"Externally resembling *L. sophodes.* Spores .011—16 mm. long, .006—7 mm. broad. Gelatina hymenea I blue then violet." *(Nyl.)* Spores .014 mm. long, .007 mm. broad.

114. *L. confragosa*, Ach. *whitish or albido-cinerascent*, granulose or *verrucoso-areolate, scattered or contiguous*, (K y C y); *apothecia fusco-nigricant or black*, sessile, margin white, entire; spores 8, fuscous, oblong, 1-septate.

On rocks, frequent.

SYN :—Ach. Meth. Suppl. p. 33 (1803.) Syn. 146. Nyl. Scand. 149.
EXS :—Lojka 2635. Rabh. 873.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...26...31.
IRELAND :—Near Lettermore and Doughruagh, Connemara. *Mr. Larbalestier.*
WALES :—Barmouth!
CHANNEL ISLANDS :—Jerbourg, Guernsey. *Mr. Larbalestier.*
"Spores .015—22 mm. long, .007—.010 mm. broad." *(T. M. Fr.)*

E. *Spores* 3-*septate.*

115. *L. pyreniospora*, Nyl. *grey or cinereo-fuscescent, granulose*, thin, sub-effuse; *apothecia fuscous-black* or *black*, opake, thalline *margin rugulose* or obsoletely *crenulate; spores* 8, fuscous, *ellipsoid*, 4-*celled, cells nucleolate*, (*spuriously* 1-3-*septate.*)

On old wood, turfy earth, and grass, rare.

SYN :—Nyl. in Ofvers. V. Ak. Forh. 1860. p. 257. note; Scand. 151.
FIG :—Nyl. Scand. t. 1. f. 6.
EXS :—Larbal. 78.
GEOG. DISTRIB :—Sweden, Scandinavia.
BOT. PROV :—7—31.
CHANNEL ISLANDS :—La Moye, Grosnez, Jersey! Coast of Jethou! *Mr. Larbalestier.*
WALES :—Gimlet Rock! Pwlhelli.
"Spores .026—32 mm. long, .010—11 mm. broad." *(Nyl.)*

116. *L. diplinthia*, Nyl. *pallido-cinerascent*, or pale-whitish, thin, *unequal* or *sub-granulose*, indeterminate; *apothecia fuscous*, small, plane, thalline *margin entire*, internally pallescent; *spores fuscous, ellipsoid, large*, 4-*locular*, the two apical cells simple, the *central cells* either simple or *with* 2 or 3 *transverse cellules;* paraphyses scarcely distinct.

On the earth, very rare. 1868.

SYN :—Nyl. Nov. Gran. p. 31. (1863.)
GEOG. DISTRIB :—Nova Granada.
BOT. PROV :—31.
CHANNEL ISLANDS :—Slopes of L'Eperquérie, coast of Sark! *Mrs. Collings.*
"Spores .023—34 mm. long, .012—16 mm. broad." *(Nyl.)* Spores .028—.029 mm. long, .013—.014 mm. broad.

117. *L. rubra*, (Hoffm.) *white* or glaucous-white, thin, effuse; *apothecia rosy* or *fleshy-red, sub-pruinose, concave*, numerous, moderate, *thalline margin rugoso-crenulate*; spores 8, colourless, oblong or oblongo-ellipsoid, 3 septate.

On trees and mossy walls, rare.

SYN :—Hoffm. Pl. Lich. 1. 81. (1793.) Ach. Syn. 177. Nyl. Scand. 171. Mudd Man. 166.
FIG :—E. Bot. 2218. Hoffm. l. c. t. 17. f. 2. Leight. Ang. Lich. t. 14. f. 1. Hepp Sporen t. 23. f. 205.
EXS :—Hepp 205. Nyl. 44. M. & N. 459. Mudd 138. Zw. 67. bis. Leight. 236. Schær. 319. Mass. 26. Reich. & Schub. 73. Rabh. 868.

GEOG. DISTRIB :—Switzerland, France, Vosges, Sweden, Bavaria, Prussia, Hungary, Germany, Italy.
BOT. PROV :—1...5...10...15...16...20.
ENGLAND :—Bilsdale ; near Rievaulx! Yorkshire. *Mr. Mudd.* Craig-y-Rhiw! near Oswestry ; Wigmore Castle ! Herefordshire. *Rev. T. Salwey.* Greta Bridge ! Yorkshire. *Mr. Borrer.* Haldon, Devon. *Mr. Parfitt.*
SCOTLAND :—Morrone ; Craig Tulloch. *Rev. J. M. Crombie.* Ben Brecht, Argyleshire. *Mr. Paterson.*
IRELAND :—Fermoy. *Mr. Carroll.*
"Spores .003 to .0035 in. long, by .00125 to .0015 in. broad. t. 3. f. 58." (*Mudd.*) "Spores .016—23 mm. long, .005—8 mm. broad." (*Nyl.*) Spores .018—.019 mm. long, .007—.009 mm. broad.

118. *L. elatina*, Ach. *whitish* or lutescent, leprose, *granulato-pulverulent*, thin, effuse ; *apothecia testaceo-fuscescent*, sessile, *plane* or *convex*, *cæsio-pruinose* or *naked*, thalline margin thin, entire, eventually obliterated ; spores 8, colourless, acicular or fusiform, 3-septate, curved or flexuose ; (thallus K yellow C—.)

On pine trees and holly, rare. 1869.

SYN :—Ach. L. U. 387. (1810.) Syn. 168. Nyl. Scand. 172.
FIG :—Sturm Deutsch. Fl. t. 20. Hepp Sporen t. 104. f. 911.
EXS :—Th. M. Fries 33. Arn. 66. Hepp 911. Anzi Ven. 42.
GEOG. DISTRIB :—Austria, Norway, Switzerland, Silesia, Germany.
BOT. PROV :—19.
IRELAND :—On aged Holly in Wood near Derrycuintry, Killarney. (Sep. 1869.) *Mr. Carroll.*
"Spores .035—.060 mm. long, .006—7 mm. broad." *(Nyl.)*

119. *L. athroocarpa*, Dub. *albido-cinereous*, *rimoso-diffract*, unequal, *granulose ; apothecia densely aggregate, deformed, fuscous-black*, *cæsio-pruinose*, thalline *margin entire ;* spores 8-16, colourless, elliptico-oblong, obtuse at the apices, 3-septate ; (thallus K—C—.)

On trees.

SYN :—Duby Bot. Gall. 2. 669. (1829.) Nyl. Scand. 168. Crombie En. 53.
EXS :—Nyl. 39.
GEOG. DISTRIB :—Scandinavia, France.
BOT. PROV :—2, 3...5.
ENGLAND :—New Forest near Lyndhurst. *Rev. J. M. Crombie.* Exeter. *Mr. Parfitt.* near Park Corner, Cirencester. *Mr. Joshua.*
"Spores .012—17 mm. long, .005—6 mm. broad. Gelatina hymenea I intense blue then vinous or violet." *(Nyl.)* Spores .0155 mm. long, .004 mm. broad.

forma *cærulescens*, Mudd. *leaden-grey*, *granuloso-verrucose*, *rugulose*, *rimoso-areolate ; apothecia pale-brown*, *plane*, *densely cæruleo-pruinose*, thalline *margin thick*, *undulate*, *angulose ; spores* 8.

On walls, &c., rare. 1861.

SYN :—Mudd Man. 140. (1861.) Crombie En. 53.
FIG :—Hepp Sporen t. 72. f. 638.
EXS :—Mudd 103. Korb. 220. Hepp 638. Mass. 276. Arn. 173.
GEOG. DISTRIB :—Germany, Hungary, Italy, Switzerland, Bavaria.
BOT. PROV :—10.
ENGLAND :—Marsk ! Cleveland. *Mr. Mudd.* (1861.)
"Spores .004 to .005 in. long, by .001 to .00125 in. broad t. 2. f. 46." (*Mudd.*)

Var. *fuscella*, (Schær.) *albido-cinereous*, very thin, effuse, *nearly evanescent ; apothecia minute*, *crowded*, *fuscescent*, *tumid*, or *biatorine*, slightly pruinose, thalline *margin entire*, *eventually nearly obliterated ; spores* 8—12, colourless, lineari-oblong, 3-septate.

On trees, frequent.

SYN :—Schærer Spicil. 397. (1823.) Crombie En. 53. Mudd Man. 140.
FIG :—Hepp Sporen t. 9. f. 76.
EXS :—Nyl. 40. Zw. 87. Hepp 76. Anzi It. S. 223. 315. Fellm. 179.
GEOG. DISTRIB :—France, Italy, Switzerland, Hungary, E. Lapland.
BOT. PROV :—2, 3.
ENGLAND :—Sussex! *Mr. Borrer.* Essex! *Mr. Piggott.* New Forest near Lyndhurst. *Rev. J. M. Crombie.*
"Spores .003 to .0035 in. long, by .001 in. broad. t. 2. f. 45." *(Mudd.)* Spores .0115—.015 mm. long, .005 mm. broad.

Var. *metabolica*, (Ach.) albido-cinerascent, thin, unequal, *difracto-sub-rimose; apothecia minute, black*, plane, *thalline margin thin, white, eventually fuscescent and concolorous with the disk.*

On trees.

SYN :—Ach. L. U. 351. (1810.) Syn. 153. Nyl. Scand. 168. Crombie En. 53.
GEOG. DISTRIB :—France, Scandinavia.
BOT. PROV :—31.
ENGLAND :—"In Anglia forte vulgaris." *Rev. J. M. Crombie.* l. c. Essex. *Mr. Piggott.*
CHANNEL ISLANDS :—Trinity! and Noirmont, Jersey. *Mr. Larbalestier.*
Spores .020—.021 mm. long, .006 mm. broad.

120. *L. prosecha*, Ach. *pale-straw-colour*, thin, contiguous, *smooth, minutely rimulose, sublobate* in the circumference (K—C—); *apothecia nigro-fuscous*, adnate or subimmersed, minute, plane, scattered, thalline margin thin, pale, entire; paraphyses indistinct; spores 8, colourless, *lineari-ellipsoid*, 1-2-3-*septate.*

On maritime rocks, rare. 1874.

SYN :—Ach. L. U. 346. Syn. 152.
GEOG. DISTRIB :—West Indies.
BOT. PROV :—7...26.
IRELAND :—Rynvyle! Kylemore Mountains! Galway. *Mr. Larbalestier.*
WALES :—Gimlet Rock! Pwllheli.
Spores .013—.0155 mm. long, .005 mm. broad.

121. *L. tetrasticha*. Nyl. *vitellinous*, deplanate, thin, *areolato-rimose;* apothecia *ochraceo-aurantiaceous, biatorine*, plane, marginate or at length sub-immarginate, (K red); spores 8, colourless, oblongo-ellipsoid, 4-locular or 3-septate.

On limestone rocks, rare.

SYN :—Nyl. in Flora 1874. p. 307.
EXS :—Anzi Lich. var. 252. ("B. rupestris var. rufescens.")
GEOG. DISTRIB :—Italy.
BOT. PROV :—16.
SCOTLAND :—Island of Lismore, Argyleshire. *Rev. J. M. Crombie.* (1875.)
Somewhat similar to *Lecanora aurantiaca var. erythrella*, (Ach.) "Belongs to the stirps of *Lecanora Brebissonii*, (Fée.) Varies with a flavo-albicant thallus. Spores .014—18 mm. long, .006—8 mm. broad." *(Nyl.)* Spores .015 mm. long, .008 mm. broad.

F. *Spores multiseptate.*

122. *L. hæmatomma*, (Ehrh.) *sulphureous* or *albido-flavescent, pulverulent, tartareo-farinose*, effuse; *apothecia scarlet*, innate or sub-sessile, moderate, thalline margin thick, flexuose, pulverulent; spores 8, colourless, acicular or fusiform, 3-7-septate, curved or flexuose; (thallus K yellow C yellow).

On rocks, not frequent. 1785.

SYN :—Ehrhart Hanov. Mag. 285. (1783.) Ach. Syn. 178. Nyl. Scand. 172. Mudd Man. 157.
FIG :—E. Bot. 223. 486. Hepp Sporen t. 73. f. 641.

EXS :—Zw. 70. Nyl. 45. Schær. 543. M. & N. 638. Mudd 130. Hepp 641. Anzi It. S. 226. Leight. 214.

GEOG. DISTRIB :—France, Norway, Germany, Apennines, Italy, Scandinavia, Sweden.

BOT. PROV :—1, 2, 3, 4, 5, 6, 7...10, 11...14, 15...19...30, 31.

ENGLAND :—Stonehenge. *Mr. Dickson.* (1785.) Tunbridge. *Mr. Forster.* Gorlestone near Yarmouth. *Messrs. Stone & Turner.* Ayton Moor ! Battersby Bank ! *Mr. Mudd.* Oswestry ! Shropshire. *Rev. T Salwey.* Hord's Park near Bridgnorth, Salop. *Mr. Purton.* Airyholme Wood ! Cleveland. *Mr. Baker.* Gunnerton Crags near Bawesford ; Heddon-on-Wall ; Harlow Hill, Northumberland ; Muggleswick Park ; High Force ; and Winch Bridge in Teesdale and near Eglestone, Durham. *Mr. Winch.* Coggeshall, Essex. *Mr. Varenne.* Penshurt Park, Kent ; Shiere, Surrey. *Mr. Holmes.* Ardingley Rocks, Sussex ; Malvern near Symonds Yatt. *Mr. W. Joshua.* Dartmoor ; Whidden Park ; Moreton, Devon. *Messrs. Jones and Kingston.* Pontesford Hill ! Nesscliffe Hill ! Shropshire.

SCOTLAND :—Salisbury Craigs near Edinburgh. *Sir J. E. Smith.* Blaeberry Hill ! Perth ; Garrynahine, Lewis ; Stennis, Orkney. *Dr. Lindsay.* Morrone ; Braemar ; Killin ; Portlethen, Kincardineshire. *Rev. J. M. Crombie.*

IRELAND :—Near Belfast. *Mr. Templeton.* Dunkerron. *Dr. Taylor.* Glenarm. *Dr. Moore.* Fairhead, Antrim ; Castlebernard Park and Glengariff. *Adm. Jones.* Western Blasquet Island, Kerry. *Mr. Carroll.*

WALES :—Barmouth ! *Rev. T. Salwey.* Harlech. *Mr. Holmes.* Cwm Ffynnon Llugwy ! Capel Arthog ! Craig Breidden !

CHANNEL ISLANDS :—L'etacq, Jersey ! Jerbourg, Guernsey. *Mr. Larbalestier.*

"Spores .009 to .013 in. long, by .00075 in. broad." (*Mudd.*) "Spores .035—.060 mm. long, .006—7 mm. broad." (*Nyl.*) "Spores .028—60 mm. long, .005—7 mm. broad." (*T. M. Fr.*)

123. *L. ventosa*, (L.) *sulphureo-virescent* or flavescent, or sometimes whitish or fusco-virescent, *tartareous, verrucoso or plicato-rugose, sub-areolato-diffract*, determinate, firm ; *apothecia red*, plano-convex, large, thalline margin thin, entire, often obliterated ; spores 8, colourless, acicular or fusiform, 5-7-septate, curved or flexuose ; (thallus K yellow C yellow.)

On lofty granitic and schistose mountain rocks, not common. 1741.

SYN :—Linn. Sp. Pl. No. 9. (1753.) Ach. Syn. 159. Nyl. Scand. 173. Mudd Man. 157.

FIG :—E. Bot. 906. Hepp Sporen t. 73. f. 643. t. 73. f. 644.

EXS :—Anzi It. S. 225. M. & N. 258. Schær. 320. Hepp 643. Tuck. 21. Bohl. 36. Zw. 69. Mudd 129. Leight. 9.

GEOG. DISTRIB :—Hungary, Italy, Austria, Norway, Tyrol Alps, Pyrenees, Sweden, Switzerland.

BOT. PROV :—1...5...7—10, 11, 12...15...18...23...29 ..31.

ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.* Casterton Fell near Kirkby Lonsdale, Westmoreland. *Sir J. E. Smith.* Yorkshire. *Mr. Dixon.* Clee Hills ! Shropshire. *Rev. T. Salwey.* Ayton Moor ! Kildale ! Cleveland. *Mr. Mudd.* Weardale, Durham. Shewing-Shields ; Cheviot and Hedgehope, Northumberland. *Mr. Winch.* Dartmoor ; Hightor Rocks ; Whiddon Park ; Easton Down ; North Bovey, Devon. *Messrs. Jones and Kingston.*

SCOTLAND :—Morchone ! Amulree ! Callernish, Lewis. *Dr. Lindsay.* Morrone, Braemar. *Rev. J. M. Crombie.* Long Island. *Prof. Balfour.*

IRELAND :—Near Dublin. *Dr. Stokes.* Slieve Croob. *Mr. Templeton.* Croghan co. Donegal ; Luggelaw. *Adm. Jones.*

WALES :—Pentre 3 m. from Glyder. *Mr. Brewer.* (1741). Moel Siabod. *Mr. W. Phillips.* Barmouth ! Penmaenmawr ! Moel-y-Golfa ! Cader Idris ! Cwm Tryfaen ! Bettws-y-coed !

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

"Spores .0075 to .011 in. long, by .00075 to .001 in. broad. t. 2. f. 52." (*Mudd.*) "Spores .040—55 mm. long, .004—5 mm. broad." (*Nyl.*) "Spores .040—55 mm. long, .003—5 mm. broad." (*T. M. Fr.*)

forma *lepadolemma*, (Ach.) *cinerascent*, subvirescent.

On mountain rocks, not common.

SYN :—Ach. Meth. 166. (1803.) Univ. 399.
FIG :—Dill. t. 18. f. 14.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—5, 6.
ENGLAND :—Corndon Hill ! Shropshire.
WALES :—Cader Idris !

## VII. DIRINA, *Fr. Nyl.*

Apothecia tuberculoso-lecanorine, hypothecium thick and black beneath. Spores fusiform, 3-septate. Spermatia slender, arcuate.

1. *D. repanda*, (Fr.) *white, tartareo-farinose*, thick, continuous or rimulose, tuberculoso-unequal, sub-lobate in the circumference (C red); *apothecia* at first closed, eventually expanded and dilated, *tuberculoso-elevated*, plano-depressed, black, *cæsio- or albo-pruinose*, rarely naked, *margin thick*, obtuse, cartilaginous, more or less inflexed and flexuose; spores 8, colourless, fusiform, 3-septate.

On maritime rocks, rare. 1867.

SYN :—Fries S. O. V. 285. (1825.) Nyl. Alger. 313. Prod. 97.
EXS :—Schær. 574. Anzi Venet. 41. Rabh. 788.
GEOG. DISTRIB :—France, Pyrenees, Austria, Sardinia, Algeria, Corsica.
BOT. PROV :—7...31.
CHANNEL ISLANDS :—La Coupe ! Jersey. *Mr. Larbalestier.*
WALES :—Great Orme's Head ! *Mr. Holmes.*

### SUB-TRIBE VII. PERTUSARIEI.

Characters as in *Pertusaria*, below.

## VIII. PERTUSARIA. DC.

Thallus crustaceous, continuous, verrucoso-unequal or smooth. Apothecia enclosed in thalline verrucæ, endocarpoid or lecanoroid, or variolarioid. Spores 1, 2, 3, 4, 5, 6-8, colourless, ellipsoid, simple, large, the external paries thick. Spermatia acicular.

### A. *Thallus K yellow, then orange-red.*

1. *P. multipunctata*, (Turn.) *cinereous*, tartareous, *verrucoso-rugose*, thin, with a fibrous border; *apothecia* 1-2 in *hemispherical verrucæ; ostiola albo-sorediate; spores* 1 (rarely 2), colourless, linear-oblong or elliptico-oblong, simple.

On trees, beech, birch. 1808.

SYN :—Turn. Linn. Trans. 9. 137. (1808.) Ach. Syn. 129. Nyl. Scand. 179. *Variolaria*, Turn. and Borr ! L. B. 73. Mudd Man. 274.
FIG :—Linn. Trans. 9. t. 10. f. 1. E. Bot. 2061. Hepp Sporen t. 76. f. 672. 673.
EXS :—Mudd 262. Hepp 672. 673. Zw. 288.
GEOG. DISTRIB :—Sweden, Italy, France, Bavaria, Germany, Philippine Islands, S. Africa.
BOT. PROV :—2, 3...5, 6, 7, 8...10, 11...19.
ENGLAND :—Sussex ! *Mr. Turner.* (1808.) Brantsdale, Yorkshire. *Dr. Carrington.* New Forest. *Mr. Lyell & Adm. Jones.* Malham, Yorkshire. *Dr. Carrington.* Durham. *Messrs. Robson and Thornhill.* St. Leonard's Forest. *Messrs. Turner & Borrer.* Haldon, Exeter. *Mr. Parfitt.* near Cirencester. *Mr. W. Joshua.* Canterbury, Toy's Hill. *Mr. Holmes.*

IRELAND :—Killarney. *Sir T. Gage.*
WALES:—Cardiganshire! *Mr. Knight.* Nannau; Pistyll-y-cain. *Mr. Holmes.* Conway falls!
"Spores .106—.140 mm. long, .028—68 mm. broad." (*Nyl.*) "Spores .060—210 mm. long, .026—58 mm. broad." (*T. M. Fr.*)

2. *P. concreta*, Nyl. *white or whitish, continuous, thickish, rimose,* unequal (K yellow then orange-red); *apothecia immersed, endocarpoid, colourless;* ostiolum dark, punctiform; *spores* 2, colourless, oblong, simple, *very large;* gelatina hymenea I—, but thecæ intensely blue.

On micaceo-schistose rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 234. *P. Westringii*, Nyl. Obs. Pyr. or. p. 35.
GEOG. DISTRIB :—North and Arctic America, Eastern Pyrenees.
BOT. PROV :—6, 7...26.
IRELAND :—By the sea, Letterfrack, Salrock! near Kylemore, Connemara. *Mr. Larbalestier.* (1876.)
WALES :—Yr Eifl! *Mr. Holmes.* Dolgelley!
An American species forming the typical state of *P. Westringii*, (Ach.) Spores .115—.250 mm. long, .052—.080 mm. broad. (*Nyl.*) Spores .140 mm. long, .07 mm. broad.

3. *P. Westringii*, (Ach.) *greyish* or *creamy-white*, tartareous, thickish, *rimoso-areolate, areolæ plane*; *verrucæ* scattered, *flat*, contorted and *difformed; ostiola brownish-black, flat*, irregular, thalline *margin abraded*; *spores* 2, colourless, elliptical, simple; (*thallus K yellow, then orange-red.*)

On rocks, old walls, &c. 1861.

SYN :—Ach. Act. Stockh. 15. 179. (1794.) Syn. 282. *P. lactescens*, Mudd Man. 272. (1861.) Crombie Enum. 59. *Isidium*, Turn. and Borr. Lich. Brit. 93.
FIG :—Westring Faergh. t. 4.
EXS :—Mudd 260. M. & N. 1066. Mass. 86.
GEOG. DISTRIB :—Italy, Vosges, Sweden, France, Switzerland, E. Falkland.
BOT. PROV :—2...7...10, 11...15...23...31.
ENGLAND :—Ayton Moor! Airyholme Bridge, Cleveland. *Mr. Mudd.* Arkendale! Thornthwaite; near Keswick; Teesdale Forest. *Rev. J. Harriman.* Tunbridge Wells! *Mr. Jenner.*
SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND :—Lough Bray near Dublin. *Mr. Turner.*
WALES :—Barmouth! *Rev. T. Salwey.* Anglesea. *Rev. Hugh Davies.* Crib Coch! Snowdon. Gimlet Rock! Pwllheli.
CHANNEL ISLANDS :—Noirmont Bay, Jersey. *Mr. Larbalestier.*
The chemical reaction and general aspect show that *Isidium Westringii*, Ach. is identical and therefore the original name is restored.

4. *P. glomerata*, (Schleich.) *yellowish-cream-colour*, effuse, *verrucoso-conglomerate*, verrucæ *globulose, smooth;* apothecia 1: *ostiola dark-brown*, punctiform, depressed or *sub-papillate; spores* 4, colourless, ellipsoid, simple; (*thallus K yellow, then orange-red.*)

On mosses in alpine localities, rare. 1864.

SYN :—Schleicher Cent. 3. 77. (1805—1807.) Ach. Syn. 111. Nyl. Scand. 182. Mudd Man. 277.
FIG :—Hepp Sporen t. 77. f. 681. Leight. Ang. Lich. t. 11, f. 2.
EXS:—Hepp 681. Schær. 120. Arn. 132. Anzi Langob. 227.
GEOG. DISTRIB :—Norway, Germany, Switzerland, Chili, N. Zealand, Melville Island.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Mr. Carroll.* (1864.) Craig-na-Calliach, Perthshire. *Dr. Maingay.* Moel Gurdy, Breadalbane. *Rev. J. M. Crombie.*
"Spores .021 to .025 in. long, by .007 to .009 in. broad." (*Mudd.*) "Spores .072—.125 mm. long, .028—44 mm. broad." (*Nyl. & T. M. Fr.*) Spores .085 mm. long, .040 mm. broad.

5. *P. ceuthocarpa*, (Sm.) *brownish-cream-colour*, tartareous, *areolato-diffract, areolæ convex, undulato-rugose; verrucæ sub-globose, conglomerate*; *ostiola minute*, punctiform, depressed, sub-papillate, brownish-black; *spores* 2, colourless, ellipsoid, simple; (*thallus K deep yellow, then orange-red.*)

On rocks, not common. 1804.

SYN:—Smith in E. Bot. t. 2372. (1812.) Turn. and Borr. Lich. Brit. 200. *Isidium microsticticum* / T. & B. l. c. 94. Mudd Man. 271.

FIG:—E. Bot. 2372. Leight. Ang. Lich. t. 9, f. 4. & t. 10. f. 1. E. Bot. 2243.

EXS:—Leight. 284. 341. 342.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5, 6, 7...11...19...23...26...31.

ENGLAND:—Pentregaer! near Oswestry. *Rev. T. Salwey.* Gunnerton! Northumberland. *Mr. F. Scott.*

IRELAND:—Connemara. *Mr. Mackay.* near Bantry! *Miss Hutchins.* South coasts. *Sir T. Gage.* Lough Bray near Dublin. *Messrs. Turner & Borrer.* Carig Mountain! *Dr. Taylor.* Dawros river! co. Galway. *Mr. Larbalestier.*

WALES:—Barmouth. *Countess of Aylesford.* (1804.) Abertygwyn! *Rev. T. Salwey.* Hafod, Cardiganshire. *Sir J. E. Smith.* Anglesea! *Rev. Hugh Davies.* Holyhead Mountain! Manorbeer! near Tenby, Pen-y-rhiw! near Fishguard, Pembrokeshire. Harlech Castle!

CHANNEL ISLANDS:—St. Brelade's, Jersey. *Mr. Larbalestier.*

"Spores .029 to .035 in. long, by .011 to .015 in. broad." *(Mudd.)* Spores .170 mm. long, .065 mm. broad.

6. *P. urceolaria*, Nyl. *albido-cinereous* or *very pale-yellow*, thickish, crustaceous, *rugose or isidiose*, rimoso-diffract, (K yellow then orange-red); *apothecia* scattered, rugoso-difformed, *innate in depressed thalline areolæ;* ostiola disciform, plane, black, margin prominent and thick; spores 1 (rarely 2) very large, ellipsoid, *nigrescent* (*K violet*); paraphyses thick, much branched.

On rocks and stone walls, very rare. 1873.

SYN:—*P. spilomantha*, Nyl. in Obs. Lich. Pyren. Orient. 3. in Flora. 1873. p. 70.

GEOG. DISTRIB:—Eastern Pyrenees.

BOT. PROV:—31.

CHANNEL ISLANDS:—Old wall on the coast, La Moye, Jersey! *Mr. Larbalestier.* (1873.)

The epispore in this species has a very peculiar granulato-papillate appearance and is easily detached from the enclosed spore or nucleus. In one ascus I saw 2 spores. Spores .90 mm. long, .51 mm. broad. "Spores .150—.215 mm. long, .065—90 mm. broad." *(Nyl.)*

7. *P. dealbata*, (Ach.) *whitish or albido-cinerascent*, tartareous, *granulose* or *papillato-unequal, rimoso-diffract; apothecia in globose pulverulent* scattered or aggregated *verrucæ*; *ostiola sub-disciform*, pale-brown, *thalline margin irregularly lacerate*; *spores* 2, colourless, ellipsoid, simple; (*thallus K yellow, then orange-red.*)

On rocks and trees, frequent.

SYN:—Ach. Prodr. 29. (1798.) Nyl. Scand. 180. *Isidium paradoxum* / and *corallinum* / and *coccodes*! α & β Turn. & Borr! Lich. Brit. 97. 100. 89. *Variolaria chlorothecia*, Tayl! Fl. Hib. *P. syncarpa*, Mudd! Man. 273.

FIG:—E. Bot. 1541. 1511.

EXS:—Arn. 204. Zw. 289. M. & N. 467. 74. Schær. 236. 237. Hepp 673. 678. Mudd 261. Leight. 320.

GEOG. DISTRIB:—France, Switzerland, Germany, Italy.

BOT. PROV:—1, 2, 3, 4, 5...7...9, 10, 11, 12...14, 15...19...26.

ENGLAND:—Kildale Moor! Ayton Moor! Bandale, Cleveland. *Mr. Mudd.*

Oswestry! *Rev. T. Salwey.* Cumberland. *Mrs. Stanger.* Norwich. *Sir W. J. Hooker.* Maresfield and Uckfield, Sussex. *Mr. Borrer.* Forncet Church Yard and Burgh Church, Suffolk. *Messrs. Turner & Borrer.* Selby, Yorkshire. *Mr. Teesdale.* Teesdale Forest, and Cronkley Fell, Durham. *Rev. J. Harriman.* Cheshire. *Mr. Bradbury.* Flixton Park, Suffolk. *Mr. Turner.* Epping Forest! *Rev. J. M. Crombie.* Kelvedon, Essex. *Mr. Varenne.* Devonshire. *Messrs. Jones & Kingston.* Caer Caradoc! Shropshire.

SCOTLAND :—Blackford near Edinburgh. *Sir J. E. Smith.* Glen Callater! *Mr. Gardiner.*

IRELAND :—Carig Mountain; Dunkerron! *Dr. Taylor.* Killarney. *Sir T. Gage.* Bantry. *Miss Hutchins.* Lough Finnehy! *Dr. Taylor.* near Letterfrack! *Mr. Larbalestier.*

WALES :—Moel Siabod. Snowdon. *Mr. Holmes.* Cwm Bochlwyd! Crib Coch! Snowdon; Aran Mowddy!

"Spores .024 to .031 in. long, by .011 to .013 in. broad." (*Mudd.*) "Spores .080—.150 mm. long, .050—82 mm. broad." (*Nyl.*) "Spores .067—.150 mm. long, .046—82 mm. broad." (*T. M. Fr.*)

8. *P. reducta*, Strtn. *cinerascent or cinereo-fuscescent*, thin, *rimuloso-areolate*, (K yellow then intense red); *apothecia* sessile, *inclosed in monocarpous thalline verrucæ, fuscous or rufo-fuscous. lecanorine, cæsio-pruinose;* spores 1, colourless or somewhat fuscescent when old, oblong; paraphyses crowded, distinct, somewhat anastomosing.

On trees, rare. 1874.

SYN :—Stirton in Scott. Naturalist 4. p. 28. (1877.)

BOT. PROV :—16.

SCOTLAND :—Ben Brecht, Argyleshire. *Mr. Paterson.* (1874.)

"Closely allied to *P. multipunctata*, (Turn.) younger spores with broadish epispore, mature ones with coarsely granular contents. Spores .09—.014 mm. long, .03—.04 mm. broad. Gelatina hymenea I blue especially the thecæ." (*Strtn.*)

## B. *Thallus K yellow, C yellow.*

9. *P. communis*, DC. *albido-cinerascent*, membranaceo-cartilaginous, smoothish or rugose, *verrucoso-areolate, verrucæ sub-globoso-deformed*; *apothecia* 1 or *more*; *ostiola minute*, punctiform, depressed, *nigricant; spores* 2 (sometimes 1 or 3), colourless, ellipsoid, simple.

On trees, common.

SYN :—D. C. Flor. Fr. 2. 320. (1805.) Nyl. Scan. 178. *Porina pertusa*, Ach. Syn. 109.

FIG :—E. Bot. 677. Leight. Ang. Lich. t. 9. f. 3.

EXS :—M. & N. 171. (in part) Schær. 118 (in part) Zw. 290. Mass. 16. Mudd 264. Hepp 222. 676. Bohl. 54. Stenh. 139. Reich. & Schub. 32.

GEOG. DISTRIB :—Europe generally, Madeira.

BOT. PROV :—1, 2, 3, 4, 5...7...10, 11...15...19...30, 31.

ENGLAND :—Torquay! Devon. *Dr. Deakin.* Oswestry! *Rev. T. Salwey.* Sussex! *Mr. Borrer.* Ayton! Cleveland. *Mr. Mudd.* New Forest! *Messrs. Turner and Lyell.* Northumberland and Durham. *Mr. Winch.* Haldon, Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Oversley and Pophills, Warwickshire; Shotover Hill, Oxford, Hord's Park, Salop. *Mr. Purton.* Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* North Bovey, Devon. *Rev. J. P. Jones.* Seven Oaks, Postling, Wye, Kent. *Mr. Holmes.* Haughmond Hill! Bomere Pool! Shrewsbury; Aymestry! Herefordshire. Arkoll Hill! Shropshire.

SCOTLAND :—Hunter's Hill, Glammis! *Mr. Gardiner.* Aberfeldy, *Dr. Holl.*

IRELAND :—Blarney! near Cork. *Mr. Carroll.* near Belfast. *Mr. Templeton.* Askew Wood co. Kerry. *Dr. Taylor.*

WALES :—Glyn! near Capel Curig; Bettws-y-coed! Trefriw! Edderton! near Forden.

CHANNEL ISLANDS :—Jersey, Guernsey, Sark. *Mr. Larbalestier.*

"Spores .039 to .045 in. long, by .017 to .018 in. broad." *(Mudd.)* "Spores .130—.160 mm. long, .048—60 mm. broad." *(Nyl.)* "Spores .130—205 mm. long, .042—65 mm. broad." *(T. M. Fr.)* Spores .170 mm. long, .060—.080 mm. broad.

forma *rupestris*, DC. verrucæ *aggregato-deformed, verrucoso-areolate.*

On rocks, common.

SYN :—D.C. l. c. Ach. Syn. 109. Nyl. Scand. 178. Mudd Man. 272.
FIG :—Hepp Sporen t. 76. f. 670.
EXS :—Nyl. 48. Mudd 259. Anzi Ven. 164. Hepp 670. Anzi It. S. 348. Zw. 244. Schær. 648.
GEOG. DISTRIB :—Switzerland, Italy, Germany, France, Madeira.
BOT. PROV :—5...7...10...15...19...31.
ENGLAND :—Ingleby Greenbow; Ayton! Cleveland. *Mr. Mudd.* Bristol. *Miss Attwood.*
SCOTLAND :—Birnam! *Dr Lindsay.*
IRELAND :—Glenarm. *Dr. Moore.*
WALES :—Barmouth!
CHANNEL ISLANDS :—St. Brelade's, Jersey. *Mr. Larbalestier.*
"Spores .039 to .049 in. long, by .012 to 017 in. broad." *(Mudd.)*

10. *P. dactylina*, (Ach.) *white*, thin, unequal, *papillato-dactyloid*, stipitate; *apothecia in the apices of the papillæ*; *spores* 1, colourless, ellipsoid, simple.

On moss in alpine districts, rare. 1870.

SYN :—Ach. Prodr. 89. (1798.) Nyl. Lapp. or. 140. Crombie En. 60. *Isidium*, Ach. Syn. 282.
FIG :—Ach. Meth. t. 3. f. 6.
EXS :—Fellm. 144.
GEOG. DISTRIB :—E. Lapland, Norway.
BOT. PROV :—7...15.
SCOTLAND :—Morrone; Cairn Turc, in Glen Dee and Glen Candlie, Braemar. *Messrs. Brown & Crombie.*
WALES :—Cwm Cywion!
Nyl. Lapp. Or. 141, says this species has no reaction with K. but Fellm. 144! and also a specimen from Norway give decided reaction K yellow C yellow. "Spores .125—220 mm. long, .065—85 mm. broad." *(T. M. Fr.)*

C. *Thallus K yellow, C reddish-orange.*

11. *P. bryontha*, (Ach.) *white* or *whitish*, thin, effuse, *sub-granulato-unequal*; *apothecia dark-livid, liver-colour* or *fuscescent*, opake, *lecanoroid*, thalline margin ultimately depressed and excluded; *spores* 1, colourless, ellipsoid, simple.

On moss in alpine places, rare.

SYN :—Ach. Meth. 167. (1803.) Syn. 156. Nyl. Scand. 178. Crombie En. 59.
EXS :—Th. M. Fr. 9. Fellm. 142. Arn. 108.
GEOG. DISTRIB :—Norway, E. Lapland, Germany.
BOT. PROV :—15.
SCOTLAND :—Cairngorm and Bennaboord, Braemar. *Rev. J. M. Crombie.*
"Spores .150—.220 mm. long, .050—70 mm. broad." *(Nyl.)* "Spores .112—230 mm. long, .040—70 mm. broad." *(T. M. Fr.)*

12. *P. melaleuca*, (Sm.) *yellowish-cream-colour, thin*, membranaceous, sub-determinate, *smoothish*; *verrucæ scattered, hemisphærico-depressed*, irregular; *ostiola brownish-black, pseudo-disciform*, depressed, thalline margin lacerate; *spores* 2, colourless, ellipsoid, simple.

On trees, not common. 1812.

SYN :—Smith in E. Bot. 2461. (1812.) T. & B. Lich. Brit. 183. Mudd Man. 275.

FIG :—E. Bot. 2461. Leight. Ang. Lich. t. 10. f. 3.
EXS :—Hepp 935. Anzi It. S. 351. 350. 352. Langob. 223. Zw. 359. Arn. 149. Welw. Lusit. 99. Körb. 268.
GEOG. DISTRIB :—Germany, Italy, Portugal.
BOT. PROV :—2, 3...7, 8...24...26.
ENGLAND :—St. Leonards Forest! Henfield! Sussex. *Mr. Borrer.* (1812.) Twycross! Leicestershire. *Rev. A. Bloxam.* Mile-end near Colchester, Essex. *Mr. Varenne.*
IRELAND :—Curraghmore. *Adm. Jones.*
WALES :—Dolgelley!
"Spores .015 to .019 in. long, by .007 to 008 in. broad." (*Mudd.*) Spores .07—.075 mm. long, .035 mm. broad.

13. *P. fallax*, (Pers.) *albido-flavescent* or *cinereo-flavescent*, subeffuse, *cartilagineo-membranaceous, smooth, plicato-rugose; verrucæ aggregato-deformed*; *ostiola brownish-black* or nigricant, *dilated, deformed*, sub-lecanoroid, *thalline margin thick, undulato-sub-crenate*; *spores* 8, colourless, ellipsoid, simple.

On trees and rocks, not common. 1801.

SYN :—Persoon fide Ach. Syn. 110. (1817.) *Thelotrema hymeneum*, Turn. and Borr. L. Br. 185. *Isidium lutescens*, Turn. and Borr. l. c. 87. Mudd Man. 276. *P. Wulfenii*, D.C.
FIG :—E. Bot. 1731 & 1529. Leight. Ang. Lich. t. 10. f. 2.
EXS :—Hepp 679. Anzi Etr. 40. Nyl. 49. Mudd 266. Zw. 292. Leight. 71. *Variolose* and *Isidioid* forms :—Anzi Etr. 41. 43. Schær. 238. Hepp 680. Zw. 297. Stenh. 143. 144.
GEOG. DISTRIB :—Germany, Switzerland, Italy, Pyrenees, France, Madeira.
BOT. PROV :—1, 2, 3, 4, 5...7...10, 11, 12...19...30.
ENGLAND :—Ingleby Park! Airyholme Wood! Cleveland. *Mr. Mudd.* Oswestry! *Rev. T. Salwey.* St. Leonards Forest! Danny! Sussex. *Mr. Borrer.* New Forest. *Mr. Lyell.* Hevingham Parsonage, Norfolk. *Rev. J. Alderson.* Epping Forest. *Mr. Forster.* Ockham, Surrey; Hurstpierpoint and Henfield! Sussex; Ickworth Park and near Bramfield, Suffolk. *Mr. Borrer.* Acle Wood, Norfolk. *Mr. Turner.* Westmoreland! *Mr. Winch.* near Eglestone; near Gibside; Horsleyhope Bourne, Durham; East Common Wood and Felton Wood on the Coquet, Northumberland. *Mr. Winch.* Frankling, Exeter. *Mr. Parfitt.* Budleigh Salterton, Devon. *Dr. Dickie.* Braxted; Messing; Yeldham, Essex. *Mr. Varenne.* Pophills and Oversley Hill, Warwickshire. *Mr. Purton.* between Polegate and Priesthawe. near Eastbourne, Sussex. *Mr. Roper.* Edenbridge, Hothfield, Chiselhurst, Seven Oaks, Kent. *Mr. Holmes.* Caer Caradoc! Haughmond Hill! Sharpstones Hill! Llanyblodwel rocks! Shropshire.
IRELAND :—Blarney! co. Cork. *Mr. Carroll.* Glenarm. *Dr. Moore.* near Belfast. *Mr. Templeton.* Askew Wood, co. Kerry; Dunkerron Mountain. *Dr. Taylor.*
WALES :—Barmouth! *Rev. T. Salwey.* Bettws-y-coed! Llanbedrog! Trefriw!
"Spores .017 to .021 in. long, by .007 to .011 in. broad." (*Mudd.*) "Spores .058—85 mm. long, .028—38 mm. broad." (*Nyl.*) Spores .07—.08 mm. long, .035—.04 mm. broad.

forma *sulphurea*, (Schær.) *sulphury-yellow, tartareous, effuse*; *verrucæ difformed, crowded into an areolato-verrucose crust*; apothecia many; ostiola punctiform, nigricant, depressed; spores 8, colourless, ellipsoid, simple.

On rocks, frequent, but generally sterile.

SYN :—Var. *rupicola*, Schær. En. 229. (1850.) Mudd Man. 276.
FIG :—Mass. Ric. f. 383.
EXS :—Schær. 594. 595. Anzi Ven. 165. Etr. 42.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7...26.
ENGLAND :—Bodbury Ring! Shropshire.
IRELAND :—Sir. T. Gage in hb. Borr! River Dawros! Galway. *Mr. Larbalestier.*
WALES :—Crib Coch! Cwm Clwyd! Llanbedrog! near Pwllheli.
"Spores .021 to .025 in. long, by .008 to .011 in. broad." (*Mudd.*)

*forma sparsilis*, Nyl. *verruce scattered and dispersed* (K yellow C reddish orange.)

On rocks, rare. 1876.

IRELAND :—Near Lough Feagh! Connemara. *Mr. Larbalestier.* (1876.)

D. *Thallus K yellow, C crimson.*

14. *P. gyrocheila*, Nyl. *cinerascent*, sub-granuloso-unequal, *rimoso-diffract; apothecia in thelotremoid tubercules*, simple or ultimately sub-gyrose, thalline margin thick, sub-gyrose; epithecium glyphoecine, hymenium pale; spores 8, colourless, ellipsoid; gelatina hymenea and theca blue with iodine.

On alpine rocks, rare. 1864.

SYN :—Nyl. in Flora 1865. p. 354.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers! *Mr. Carroll.*
"Spores .068—70 mm. long, .036—50 mm. broad." (*Nyl.*)

E. *Thallus K—, C crimson.*

15. *P. velata*, (Turn.) *milk-white* or *whitish*, smoothish or rugoso-unequal, *rimulose*, determinate, *radiato-rugose* or *plicate towards the circumference, verruce small, depressed, concolorous; apothecia* pale, plane, *leconoroid; spores* 1, colourless, ellipsoid, simple, *very large.*

On trees and rocks, rare. 1808.

SYN :—Turner in Linn. Trans. 9. 143. (1808.) *Variolaria lactea*, Turn. & Borr! L. Br. 69. *Variolaria asperyilla*, T. & B.! l. c. 67. *Variolaria conspurcata*, T. & B.! l. c. 55. *Isidium coccodes*, β. T. & B.! l. c. 89.

FIG :—Linn. Trans. 9. t. 12. f. 1. E. Bot. 2062. *V. asperyilla*, E. Bot. 2401. *V. lactea*, E. Bot. 2410. Ach. Meth. t. 1. f. 6. *V. conspurcata*! E. Bot. 964. Mudd Man. t. 5. f. 114.

EXS :—Maudon 7. Welw. Lusit. 98. Zw. 296. Hepp 677. Bohl. 26. Schaer. 596.

GEOG. DISTRIB :—Madeira, Ceylon, Italy, Norway, Martinique, St. Vincent, Ohio.

BOT. PROV :—1, 2, 3, 4, 5...7, 8...11, 12...15, 16...19...30.

ENGLAND :—St. Leonard's Forest; Henfield; Itchenor, Sussex. *Mr. Borrer.* New Forest! *Adm. Jones.* Oswestry! *Rev. T. Salwey.* Northern Counties. *Rev. J. Harriman.* Charnwood Forest! Leicestershire. *Rev. A. Blomm.* Henham; Wrentham; Ickworth; Herringfleet, Suffolk. *Mr. Borrer.* Horsley-hope Bourn. *Messrs. Thornhill & Robertson.* Burgh Castle, Suffolk; Scole Inn, Norfolk. *Mr. Turner.* Cawston Church. *Sir. J. E. Smith.* Stoke Wood, Exeter. *Mr. Parfitt.* Braxtead, Essex. *Mr. Varenne.* Moreton, Devon. *Rev. J. P. Jones.* Challock Wood, near Wye, Tunbridge Wells, Kent. *Mr. Holmes.* Haughmond Hill! Shomere Moss! Shropshire.

SCOTLAND :—Invercauld; Sidlaw Hills! *Mr. Gardiner.* Ben Brecht, Argyleshire. *Mr. Paterson.*

IRELAND :—Near Bantry. *Miss Hutchins.* Ballygally Head, Antrim. *Dr. Moore.* Kenmare River. *Dr. Taylor.* Glengariff. *Adm. Jones.* Dromore, co. Kerry. *Dr. Taylor.*

WALES :—Anglesea. *Rev. Hugh Davies.* Holyhead! Cader Idris. *Mr. Holmes.* Cwm Cywlon! Aran Mowddy! Twll Du! Crib Coch!

"Spores .051 to .061 in. long, by .014 to .016 in. broad." (*Mudd.*) "Spores .214—.310 mm. long, .067—.090 mm. broad." (*Nyl.*) Spores .490 mm. long, .14 mm. broad.

F. *Thallus K—, C rose-colour.*

16. *P. faginea*, (L.) *glaucous-white*, thickish, tartareous,

effuse or sub-determinate, brown and zonate at the circumference, smooth, *rugose; verrucæ convex*, confluent, sorediate, margin narrow, obscure, eventually excluded; spores not seen.

On trees and rocks, common.

SYN :—Linn. Sp. Pl. No. 10. (1753.) Turn. & Borr. ! Lich. Brit. 64. *V. ilicea* ! Lyell ! MS. in herb. Borrer.
FIG :—E. Bot. 1713.
EXS :—M. & N. 264. Mudd 263.
GEOG. DISTRIB :—Arctic America.
BOT. PROV :—1, 2, 3, 4, 5...10...15...30.
ENGLAND :—Sussex ! *Mr. Borrer*. near Ayton ! Cleveland. *Mr. Mudd*. New Forest ! *Mr. Lyell*. Devon. *Messrs. Jones and Kingston*. Great Glenham, Suffolk. *Rev. E. N. Bloomfield*. Bexley, Penshurst, Postling, Shoreham, Kent. *Mr. Holmes*. Haughmond Hill ! Shropshire.
SCOTLAND :—Hunter's Hill, Glammis ! *Mr. Gardiner*.
IRELAND :—Near Belfast and Devis Mountain. *Mr. Templeton*.
Although I have been unable to detect spores, yet the different chemical reaction indicates this to be distinct.

G. *Thallus K—C—*.

17. *P. ophthalmiza*, Nyl. *greyish, thin, smoothish*, or *slightly rugoso-unequal, verrucæ crowded, small, albo-sorediate; apothecia* 1 rarely 2 or three in each verruca, *lecanoroid*, nigricant, *thalline margin rugose*, or *sub-leprose; spores* 1, colourless, ellipsoid.

On aged pine trees, rare. 1864.

SYN :—Nyl. Scand. 180. (1861.) Flora 1865. p. 354.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Glenfalloch ! *Messrs. Jones & Carroll*. (1864.)
"Spores .160—.205 mm. long, .080—.100 mm. broad." (*Nyl.*)

18. *P. globulifera*, (Turn.) *greyish*, cartilagineo-membranaceous, *verrucoso-rugose, albo-sorediate*, smooth, zonate and brown at the circumference; *verrucæ large, globular, closed, slightly depressed*, lycoperdoid, *eventually lacerato-dehiscent, and pseudo-scutelliform, albo-sorediate*, *spores* 1 or 2, colourless, ellipsoid, simple, large.

On trees, rare. 1802.

SYN : —*Variolaria*, Turner in Linn. Trans. 9. 139. (1808.) Nyl. Scand. 180. Turn. & Borr. L. Br. 59. Ach. Syn. 130. *V. discoidea*, T. & B. ! l. c. 61.
FIG :—Linn. Tr. 9. t. 10. f. 2. E. Bot. 2008. and 1714.
EXS :—Schær. 597. Bohl. 96. Anzi It. S. 346. 347.
GEOG. DISTRIB :—Europe, Ohio, Tasmania.
BOT. PROV :—1, 2, 3, 4, 5...7...10...19...26.
ENGLAND :—Yarmouth; and St. Leonard's and Danny ! Sussex ! *Mr. Borrer*. 1802.) Craig-y-Rhiw ! and Llanforda ! near Oswestry. *Rev. T. Salwey*. New Forest ! *Adm. Jones*. Malham, Yorkshire. *Dr. Carrington*. Brantsdale; Kildale, Yorkshire. *Mr. Mudd*. Kelvedon, Essex. *Mr. Varenne*. Bagtor Wood; Ilsington, Devon. *Messrs. Jones and Kingston*. Paradise, Eastbourne. *Mr. Roper*. near Cirencester. *Mr. W. Joshua*. Coxwall Knoll ! near Bucknell, Chudleigh ! Penshurst, Ightham, Postling, Kent. *Mr. Holmes*. Llanyblodwel rocks ! Shropshire.
IRELAND :—Castlemartyr Deer Park co. Cork. *Mr. Carroll*. Ashley Park ! near Galway. *Mr. Larbalestier*.
WALES :—Bala, Dolmelynon. *Mr. Holmes*.

19. *P. Hutchinsiæ*, (Turn. & Borr.) *white* or *cream-colour*, thin, effuse, *minutely rugoso-unequal; verrucæ small, crowded*, deformed, *pseudo-disciform;* ostiola *large, brownish-black*, cæsio-pruinose, *depressed*, margin lacerate; *spores* 1, colourless, ellipsoid, simple, large.

On moss in alpine districts, rare. 1812.

SYN :—*Thelotrema*, Turn. & Borr. L. Br. 178. (1813). Mudd Man. 277.
FIG :—E. Bot. Suppl. 2652. Leight. Ang. Lich. t. 11. f. 1.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Near Bantry! *Miss Hutchins.* (1812.)
"Spores .042 to .052 in. long, by .014 to .016 in. broad." (*Mudd.*) Spores .095 mm. long, .055 mm. broad.

20. *P. glomulifera*, (Borr.) *whitish*, thin, effuse, *verrucæ globoso-obovate*, smooth; apothecia 1; ostiola *small, punctiform* or *papillate, depressed, nigricant; spores* 4, colourless, ellipsoid, simple.

On moss in alpine places, rare.

SYN :—Leight. Ang. Lich. 30. (1851.) Mudd Man. 277.
FIG :—Leight. l. c. t. 11. f. 2.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Highlands! *Mr. Borrer and Dr. Maingay.*

21. *P. pustulata*, (Ach.) *grey* or *greyish-olive*, smooth, thin, effuse, *contiguous* or *rimose; verrucæ* scattered, hemispherical, *convex, small; apothecia many; ostiola dark-brown, punctiform*, slightly depressed; *spores* 2, colourless, ellipsoid, simple.

On trees.

SYN :—Ach. L. U. 309. (1810.) Syn. 110. Nyl. Prodr. 195. Leight. Ang. Lich. 30. Mudd Man. 275.
FIG :—Leight. l. c. t. 10. f. 4.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3 ..5...7...(19- 30)...31.
ENGLAND :—Shanklin! Isle of Wight. *Dr. Holl.* Budleigh Salterton, Devon. *Dr. Dickie.* Braxted; Messing; Yeldham, Essex. *Mr. Varenne.* near Cirencester. *Mr. W. Joshua.*
IRELAND :—Frequent. *Mr. Carroll.*
WALES :—Near Dolgelley! Tanybwlch! near Capel Curig.
CHANNEL ISLANDS :—Guernsey! *Rev. T. Salwey.* Quenvais, Jersey. *Mr. Larbalestier.*
"Spores .016 to .021 in. long, by .007 to .009 in. broad." (*Mudd.*)

22. *P. leioplaca*, (Ach.) *glaucous-white* or *pale-yellowish-brown*, membranaceous, smooth, *verrucæ* scattered, *depresso-hemisphærical, large; apothecia* 1; ostiola brownish-black, punctiform, slightly depressed; *spores* 4, (sometimes 5 or 6 or 8), colourless, ellipsoid, simple.

On trees, not uncommon.

SYN :—Ach. L. U. 309. excl. var. (1810.) Syn. 110. Nyl. Scand. 181. Mudd Man. 276.
FIG :—Hepp Sporen t. 77. f. 675.
EXS :—Hepp 675. Mudd 267. M. & N. 847. Schær. 119. Zw. 291. A. Stenh. 141. Smrft. 57.
GEOG. DISTRIB :—Sweden, Germany, Switzerland, Scandinavia.
BOT. PROV :—2, 3...5...7...10 ..15...19...24...26...31.
ENGLAND :— Sowerdale! Hoggatts Wood; Airyholme; Cleveland. *Mr. Mudd.* Yoxall Lodge! Staffordshire. *Rev. A. Bloxam.* Sussex! *Mr. Borrer.* Shanklin! Isle of Wight. *Dr. Holl.* Kelvedon, Essex. *Mr. Varenne.* Woolwich Wood; Sibertswold, Dover, Wye, Ightham, Seven Oaks, Canterbury, Kent. *Mr. Holmes.* Old Town Fields, Eastbourne. *Mr. Roper.* Nesscliffe Hill! Weir Coppice! near Shrewsbury. Llanyblodwel rocks!
SCOTLAND :—Braemar. *Rev. J. M. Crombie.* Castleton. *Adm. Jones.*
IRELAND :—Killarney. *Mr. Carroll.* Curraghmore. *Adm. Jones.* Castle Taylor, Galway. *Dr. Moore.* Renvyle Wood! near Kylemore co. Galway. *Mr. Larbalestier.*
WALES :—Craig Breidden! Drwsynant! Bettws-y-coed! Trefriw! Edderton Wood! near Forden.

CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier.*
"Spores .014 to .021 in. long, by .005 to .009 in. broad." (*Mudd.*) "Spores .042—75 mm. long, .020—38 mm. broad." (*Nyl.*) "Spores .042—90 mm. long, .020—38 mm. broad. Spores 8=.034—60 mm. long, .016—30 mm. broad." (*T. M. Fr.*)

23. *P. nolens*, Nyl. *cinereous, smooth, areolato-rimose*, determinate; apothecia *innate, without thalline prominence*; *ostiola black*, plane, rotundate, oblong or deformed, 2 or more approximate, colourless within; *spores* 8, colourless, ellipsoid, simple; thecæ cylindrical, intensely blue with iodine.

Externally much like *Lecanora cinerea*.

On maritime basaltic rocks, rare. 1864.

SYN :—Nyl. in Flora 1864. p. 489.
GEOG. DISTRIB :—Europe.
BOT. PROV :—30.
IRELAND :—Glenarm, co. Antrim! *Adm. Jones.* Lough Feagh! Connemara. *Mr. Larbalestier.*
Spores .026—.027 mm. long, .013—.014 mm. broad.

24. *P. xanthostoma*, (Smmrf.) *milk-white*, smooth, thin, *verrucæ subglobose*, somewhat depressed above, *2 or 3 concrescent*; apothecia 1 or 2 in each thalline verruca; *ostiola depressed, pale or pallido-lutescent*; spores 4, colourless, ellipsoid, simple.

On *Erica tetralix*. Very rare.

SYN :—*Porina xanthostoma*, Smmrf. in V. Ak. H. 1823. p. 115. *Endocarpon*, Smmrf. Lapp. 136. Nyl. Scand. 182.
EXS :—Smmrf. Norveg. 142. T. M. Fr. 74.
GEOG. DISTRIB :—Norway.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.*
"Spores .060—76 mm. long, .034—40 mm. broad" (*Nyl.*) "Spores .055—76 mm. long, .0032—40 mm. broad. (*T. M. Fr.*)

25. *P. inquinata*, (Ach.) *cinerascent, areolato-* or *verrucoso-rimose*; *apothecia innate*, one or more in each areola; *ostiola black*, nearly plane, *variously flexuoso-deformed and rotundate*, margin thin, irregular, persistent, *paler*; spores 8, colourless, rotundo-ellipsoid, simple.

On rocks, very rare. 1876.

SYN :—Ach. L. U. 353. (1810.) T. M. Fr. L. Scand. 311.
GEOG. DISTRIB :—Sweden, Norway.
BOT. PROV :—26.
IRELAND :—Lettermore! Connemara. *Mr. Larbalestier.* (1876.)
"Spores .025—30 mm. long, .014—18 mm. broad. Thecæ alone I blue." (*T. M. Fr.*) Spores .034 mm. long, .021 mm. broad. Paraphyses distinct.

26. *P. incarnata*, Leight. *creamy-white*, thin, tartareous, effuse, *smooth, plane, minutely rimuloso-diffract.* (K — C —.); *apothecia single, of a waxy appearance, paler than the thallus, prominent*, sessile, *depresso-globose*, variable in size according to age, in maturity large; *ostiolum yellowish-flesh-colour, lecanoroid*, at first small and round, poriform, eventually *dilated and urceolate, surrounded by a broad, thick, pale, waxy, thalline margin*; hymenium in section ceraceo-gelatinose, flesh-coloured; paraphyses slender,

more or less branched and entangled, apices colourless; *spores* 2, colourless, *very large, lineari-oblong or ellipsoid, simple, with a very narrow limb or epispore.*

On granite rocks, very rare. 1875.

SYN :—Leight. in Linn. Trans. 2d ser. 1. 241. (1877.)
FIG :—Linn. Trans. l. c. t. 33. f. 1. 2 & 3.
BOT. PROV :—26.
IRELAND :—Doughruagh Mountain! *Mr. Larbalestier.* (1875.)
Spores .062—.067 mm. long. .033—.035 mm. broad. Gelatina hymenea I violet.

This beautiful lichen is excessively rare, and apparently quite new to science. It has occurred only once to Mr. Larbalestier, whose indefatigable and skilful lichenological researches in the west of Ireland have added so many and such rare novelties to our lichen-flora. In general external aspect it a good deal resembles *Lecanora epulotica*, Ach., for which it might cursorily be readily mistaken; but the number, size, and shape of the spores and other characters keep them abundantly apart. It seems allied to *Pertusaria rhodoleuca*, Th. Fries; but that species is at once distinguished by its 8 smaller spores. *Pertusaria rhodocarpa* of Garovaglio's 'Comment. de Pertusariis Europ. Med.' p. 8, t. iv. f. 4, is like it in the large size and narrowly limbed two spores, but differs in growing on mosses, and having a verrucoso-granulose thallus and coacervate aggregate numerous apothecia. Garovaglio's plant, which he refers doubtfully to *P. rhodocarpa*, Krbr. (Syst. p. 384), cannot be identical with that German lichen, inasmuch as Th. Fries, who has examined an original specimen from Körber, 'in Lich. Scand.' p. 322, refers Körber's lichen to *Varicellaria rhodocarpa*, Th. Fr., which has an immense single 1-septate spore, and is represented in Th. Fr. L. Scand. Exs. 73! and has reaction K—, C crimson, and is altogether different in its sorediate thallus.

H. *Thallus K brownish, C—.*

27. *P. fastigiata*, (Turn. & Borr.) *albido-cinereous*, tartareous, thick, *consisting of erect closely juxta-posed simple columns*, their apices *fastigiate*, forming an areolate surface, *areolæ convex*, rough, *papillato-sorediate* or pulverulent; apothecia 2, 3, 4 or 5; spores not seen.

On siliceous rocks, rare. 1813.

Dr. Taylor Fl. Hib. 2. 114. well describes this lichen his *Variolaria polythecia* as forming large patches on the rocks, "conspicuous by the crowded and stalked apothecia, placed in contact, like certain basaltic columns." His specimens in the Hook. Herb. at Kew are perfectly identical with the authentic specimens of *Isidium oculatum*, β *fastigiatum* of T. & B. Lich. Brit. 103. in the Borrer Herb. A vertical section shewed sufficient to enable us to regard this a Pertusaria, although the microscope failed to discover the spores.

SYN :—*Isidium oculatum* β *fastigiatum*, Turn. & Borr.! Lich. Brit. 103. (1813.) *Variolaria polythecia*, Tayl.! Fl. Hib. 2. 114.
BOT. PROV :—19...26.
IRELAND :—Connemara. *Mr. Mackay.* near Bantry! *Miss Hutchins.* Dunkerron! *Dr. Taylor.* Boar's Head Rocks! *Mr. Borrer.*

28. *P. sublactea*, (Leight.) *creamy-yellow*, tartareous, thin, *undulato-rugose*, very slightly rimose; *apothecia* scattered, distinct, elevated, *depresso-convex, albo-sorediate;* spores unknown.

On siliceous rocks, rare. 1813.

This occurs as a single specimen in Borrer Herb. at Kew, under the name of *Variolaria lactea*. *V. lactea* and its var. *arenaria*, T. & B.! Lich. Brit. 69. have reaction K—C crimson and are referable as states of *P. velata*, Turn. The present lichen has a totally different reaction K pale-brownish-yellow C— and is no doubt the plant spoken of in the Lich. Brit. p. 72.
SYN :—Turn. & Borr. Lich. Brit. 72. (1813.)

GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—*Miss Hutchins & Sir Thos. Gage.*

## IX. PHLYCTIS, *Wallr.*

Thallus slightly crustaceous, continuous or pulverulent. Apothecia erumpent, rotundato-difformed, thalline margin indistinct. Spores 1-2, colourless, ellipsoid or oblong, murali-divided, large. Spermatia short, slender, straight.

1. *P. agelæa*, (Ach.) whitish or albo-canescent, thin, subdeterminate or effuse, rugose or sub-leprose or sub-lævigate, rimoso-diffract; apothecia irregular, depressed, scattered or crowded, nigricant, albido-or cæsio-suffused, thalline margin leprose, inflexed, irregularly crenate; *spores* 2, luteo-fuscescent, *ellipsoid*, murali-divided, *apically mucronate;* (thallus K yellow, then orange.)

On trees, frequent. 1807.

SYN :—Ach. Prod. 30. (1798.) Syn. 117. Nyl. Scand. 184. Mudd Man. 279. *Variolaria*, Turn. & Borr ! Lich. Brit. 78.
FIG :—E. Bot. 1730. Hepp Sporen. t. 80. f. 703.
EXS :—Nyl. 54. Hepp 703. Mudd 269. Anzi It. S. 345. Rabh. 807. Mass. 206. Zw. 298. Leight. 282.
GEOG. DISTRIB :—Italy, Germany, Bavaria, France, Switzerland.
BOT. PROV :—2, 3, 4, 5...7...10...19...24...26...31.
ENGLAND :—Yarmouth ! *Mr. Turner.* (1807.) Sussex ! *Mr. Borrer.* Hoggarts Woods ! Ingleby; Airyholme Wood ! Kildale; Yorkshire. *Mr. Mudd.* Hatfield Broad Oak; Braxted, Essex. *Mr. Varenne.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Epping Forest; New Forest. *Rev. J. M. Crombie.* Penshurst, Edenbridge, Hythe, Lympne, Sandgate, Newington, Beechborough, Biddenden, Frittenden, Charing, Lenham, Sibertswold, Kent. *Mr. Holmes.* Haughmond Hill ! Shropshire. Huglith ! near Church Stretton.
IRELAND :—Castlebernard Park, Bandon. *Adm. Jones.* Castle Taylor, Galway. *Dr. Moore.* Kitsboro'; and Riverstone, Cork. *Mr. Carroll.*
WALES :—Edderton Wood ! Forden, Montgomeryshire.
CHANNEL ISLANDS :—Jersey, Guernsey. *Mr. Larbalestier.*
"Spores .012 to .017 in. long, by .004 to .007 in. broad." (*Mudd.*) "Spores .045—70 mm. long, .014—27 mm. broad." (*Nyl.*) "Spores .045—72 mm. long, .014—32 mm. broad." (*T. M. Fr.*)

2. *P. argena*, (Ach.) silvery-grey or cream-colour, thin, effuse, rugose or sublævigate, pulverulent; apothecia orbicular, scattered or crowded, depressed, pulverulent, brown, cæsio-pruinose, thalline margin rugose, inflexed; *spores* 1, luteo-fuscescent, narrow-oblong or *cylindraceo-oblong*, *5-septate*, *murali-divided*, very large; (thallus K yellow, then red.)

On trees, frequent. 1808.

SYN :—Ach. Prodr. 8. (1798.) Meth. 74. Syn. 47. Nyl. Scand. 184. Mudd Man. 280. *Variolaria*, Turn. and Borr. ! L. Br. 75.
FIG :—Hepp Sporen t. 80 f. 705.
EXS :—Hepp 705. Zw. 299. Rabh. 806.
GEOG. DISTRIB :—Switzerland, Germany.
BOT. PROV :—2, 3...7, 8...10.
ENGLAND :—Sussex ! *Mr. Borrer.* Kildale, Cleveland. *Mr. Mudd.* Charnwood Forest ! Leicestershire. *Rev. A. Bloxam.* New Forest and near Exeter. *Rev. J. M. Crombie.* Selling, Hythe, Tunbridge, Biddenden and Beechborough, Kent; Shere, Surrey. *Mr. Holmes.*
WALES :—Dolgelley. *Mr. Holmes.* Bettws-y-coed !
"Spores .025 to .032 in. long, by .007 to .009 in. broad." (*Mudd.*) "Spores .100—.140 mm. long, .027—50 mm. broad." (*Nyl. & T. M. Fr.*)

## SUB-TRIBE VIII. THELOTREMEI.

Apothecia verrucæform, open. Spores 8, murali-divided.

### X. THELOTREMA. *Ach.*

Thallus slightly crustaceous, continuous. Apothecia verrucæform, at first closed, then open; ostiolum rotundo-poriform, margin double, external or thalline one thin, even, internal or proper one membranaceous, lacero-dehiscent, disk urceolate, depressed; spores 8, colourless, fusiform, murali-divided.

1. *T. lepadinum*, Ach. *whitish* or *yellow-cream-colour*, sub-effuse, smooth or slightly ruguloso-unequal; *apothecia hemisphærical*, scattered, *ostiolum round, open*, margin even; *disk urceolato-scutelliform*, dark-brown, cæsio-pruinose or naked, *proper margin lacerate, inflexed;* spores 8, colourless, oblongo-fusiform, murali-divided.

On trees, holly, frequent, rarely on rocks. 1800.

SYN :—Ach. Prodr. 30. (1798.) Syn. 115. Nyl. Scand. 185. Turn. & Borr. ! Lich. Brit. 180. Mudd Man. 278.

FIG :—E. Bot. 678. Leight. Ang. Lich. t. 12. f. 1.

EXS :—Schær. 121. Bohl. 29. Mudd 268. M. & N. 257. Zw. 352. Nyl. 50. Hepp 948. Leight. 121.

GEOG. DISTRIB :—Sweden, Norway, Switzerland, France, Germany, Spain, Guyana, N. Zealand.

BOT. PROV :—1, 2, 3, 4, 5, 6, 7...10, 11...15...(19—30)...26

ENGLAND :—Eglestone and Teesdale Forest, Durham. *Rev. J. Harriman.* (1800.) Sussex! *Mr. Borrer.* King's Wood, Roche Abbey! Yorkshire. *Mr. Bohler.* near Old Ryland! Yorkshire. *Mr. Baker.* Baysdale! Airyholme! Hob Hole! Cleveland. *Mr. Mudd.* near Beverley. *Mr. Teesdale.* Studley Woods, Yorkshire. *Mr. Brunton.* New Forest. *Mr. Lyell.* Costesey near Norwich. *Sir. W. J. Hooker.* St. Leonard's Forest and near Tunbridge Wells. *Messrs. Turner and Borrer.* Gibside; Ravensworth and Cawsey Woods, Durham; Bearl Wood; East Common Wood and Felton Woods, Northumberland. *Mr. Winch.* Stoke Wood, Exeter. *Mr. Parfitt.* Devon. *Messrs. Jones & Kingston.* Ightham, Kent. *Mr. Holmes.* Haughmond Hill! Holly Park! near Stokesay. Shropshire.

SCOTLAND :—Loch Katrine, Breadalbane. *Rev. J. M. Crombie.*

IRELAND :—Common on trees, rare on rocks. *Mr. Carroll.* Lough Muck! co. Galway. *Mr. Larbalestier.*

WALES :—Hafod, Cardiganshire. *Sir. J. E. Smith.* Cors-y-gedol! *Rev. T. Salwey.* Dolgelley! Bettws-y-coed!

"Spores .012 to .018 in long, by .003 to .0045 in. broad. t. 5. f. 116." *(Mudd.)* "Spores .035—70 mm. long, .011—16 mm. broad." *(Nyl.)* Spores .080—.090 mm. long, .015—.020 mm. broad.

forma *rupestre*, T. & B. *deep-yellow* or *ochrey*, *tartareous, dispersed; apothecia deformed*, crowded, ostiolum dilated, *thalline margin tumid*, disk darker-brown; spores 1-2.

On rocks, not common. 1813.

SYN :—Turn. & Borr. Lich. Brit. 180. (1813.) Leight. Ang. Lich. 32. Mudd Man. 278. var. *scutelliforme*, Ach. L. U. 313. Syn. 115.

FIG :—Leight. Ang. Lich. t. 12. f. 2.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...7...11...26.

ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.* Sussex. *Mr. Borrer.*

IRELAND :—Dunkerron! *Dr. Taylor.* Kylemore Castle! co. Galway. *Mr. Larbalestier..*

WALES :—Llyn Bodlyn! *Rev. T. Salwey.*

Spores .070 mm. long, .015 mm. broad.

2. *T. subtile*, Tuck. whitish or *milky-white*, macular, somewhat shining; *apothecia erumpent, small, white, thalline margin slightly prominent, proper margin albo-pulverulent; spores* 8, colourless, oblong, 10-13-celled.

On young oaks and birch, very rare. 1864.

SYN :—Tuck. Suppl. 1. 426. (1858.) Nyl. in Flora 1854. p. 491.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—19...26...29.
IRELAND :—Lough Inchiquin co. Kerry; Croghane, Turk Mountain, and Cromaglown, Killarney; near Derrycundry and at the Eagles Nest. *Mr. Carroll.* (1864.) Glengariff. *Adm. Jones.* Glenveigh co. Donegal, *Dr. Moore.* Derryclare Island! co. Galway. *Mr. Larbalestier.*
"Spores .040—56 long, .009—.010 mm. broad." *(Nyl.)*

## XI. URCEOLARIA, *Ach. pr. p. Nyl.*

Thallus crustaceous. Apothecia urceolate. Spores 8, fuscous, septato-murali-divided. Spermatia cylindrical.

1. *U. scruposa*, (L.) *albido-cinerascent*, tartareous, *verrucoso-rugose or granulose*, areolato-diffract, areolæ verrucoso-rugose; *apothecia* immersed, *urceolate, black*, more or less *cinereo-pruinose, proper margin nigricant, thalline margin thick, rugose* or *crenulate on the inner side;* spores 8, virescenti-fuscescent, ellipsoid, 5-septate, murali-divided; (thallus C red.)

On rocks, walls, &c., frequent. 1741.

SYN :—Linn. Mant. 2. 131. (1771.) Ach. Syn. 142. Nyl. Scand. 176. Mudd Man. 165.
FIG :—E. Bot. 266. Leight. Ang. Lich. t. 11. f. 3.
EXS :—M. & N. 169. Schær. 132. 289. Anzi It. S. 227. 229. Leight. 54. 379. Hepp 915. Fellm. 141. Nyl. 46. Mudd 137. Mass. 359.
GEOG. DISTRIB :—Switzerland, Germany, Italy, Pyrenees, France, E. Lapland, New Zealand, Ceylon.
BOT. PROV :—2, 3, 4, 5...7, 8...10, 11, 12...19...22, 23, 24...26...31.
ENGLAND :—Norfolk, Suffolk, and Cambridgeshire. *Sir J. E. Smith.* Darkingham, Surrey. *Dillenius* (1741.) Gogmagog Hills; Newmarket Heath. *Rev. R. Relhan.* Lonsdale! Lanbraughrigg! Cleveland. *Mr. Mudd.* near Eglestone; Harewood Forest, between Widdy Bank and Cauldron Snout, Durham. *Mr. Winch.* Duryard, Exeter. *Mr. Parfitt.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* near Wooton-under-Edge. *Mr. W. Joshua.* Guestling, Sussex. *Rev. E. N. Bloomfield.* Foreshield, Alston, Cumberland. *Rev. W. Johnson.* Hayes Common, Penshurst, Ightham, Tunbridge Wells. *Mr. Holmes.* High Rock! near Bridgnorth; Haughmond Hill! Bayston Hill! Lyth Hill! near Shrewsbury! Cold Hatton Heath! Loppington! Grinshill! Shropshire. Stannor Hill! Herefordshire.
IRELAND :—Dunkerron, Kerry; Portmarnock, Dublin. *Dr. Taylor.* Glendalough, Wicklow. *Adm. Jones.* Loughcooter, Galway. *Mr. Carroll.* Killarney. *Mr. Hardy.*
WALES :—Dolgelley, Cader Idris. *Mr. Holmes.* Barmouth! Aran Mowddy!
CHANNEL ISLANDS :—Jersey; Guernsey; Sark. *Mr. Larbalestier.*
"Spores .005 to .007 in. long, by .002 to .00275 in. broad. t. 3. f. 57." *(Mudd.)*
"Spores .026—38 mm. long, .012—15 mm. broad." *(Nyl. & T. M. Fr.)* Spores .025 mm. long, .012 mm. broad.

forma *gypsacea*, (Ach.) *creamy-white, thick, soft, rugoso-unequal, sub-pulverulent*, sub-areolate; *apothecia urceolate*, black, cæsio-pruinose; thalline *margin tumid*, inflexed; (thallus C red.)

On calcareous rocks, rare.

SYN :—Ach. L. U. 338. (1810.) Syn. 142.

FIG :—Hepp Sporen t. 104. f. 916.
EXS :—Anzi Langob. 327. 333. Zw. 76. Mass. 139. Arn. 95. Hepp 916.
GEOG. DISTRIB :—Portugal, Switzerland, Spain, Finland, Tyrol, Italy.
BOT. PROV :—5...7...10...12...15...26.
ENGLAND :—Cumberland! *Mrs. Stanger.* Kildale! Cleveland. *Mr. Mudd.* Llanymynech Hill! Shropshire.
SCOTLAND :—Moffat. *Rev. W. Johnson.*
IRELAND :—Glancorbol. *Mr. Larbalestier.*
WALES :—Llyn-y-Cae! Cader Idris. Moel-y-gest! near Tremadoc.

forma *bryophila*, Ach. *greyish-white* or white, granulato-rugose, *effuse;* apothecia urceolate, immersed, nigro-cæsious, margin tumid, inflexed and crenulate; (C red.)

On mosses and Cladoniæ, rare.

SYN :—Ach. Meth. 148. (1804.) Syn. 10. Nyl. Scand. 177. Mudd Man. 165.
FIG :—Hoffm. Pl. L. t. 21. f. 1. Leight. Ang. Lich. t. 11. f. 4. Hepp Sporen t. 23. f. 210.
EXS :—Mass. 150. Anzi It. S. 228. 230. Hepp 210. Schær. 290. M. & N. 170. Nyl. 129. Leight. 359. 360.
GEOG. DISTRIB :—Switzerland, Germany, Sweden, France, Italy, Hungary, Russia.
BOT. PROV :—3...5...7...15...19...28...31.
ENGLAND :—Oswestry! *Rev. T. Salwey.* Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* High Rock! near Bridgnorth; Church Stretton! Shropshire; Bredon Hills! Leicestershire.
SCOTLAND :—Glen Lochy, Breadalbane. *Rev. J. M. Crombie.*
IRELAND :—Kerry. *Dr. Taylor.* Armagh. *Adm. Jones.* Kilcully near Cork. *Mr. Carroll.*
WALES :—Llyn Gwernan!
CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier.*
Spores .026 mm. long, .013 mm. broad.

## TRIBE XV. LECIDEINEI.

### I. LECIDEA. *Ach. Nyl.*

Thallus crustaceous, various, squamose, granulose, areolate, powdery or evanescent. Apothecia patellulate, discoloured (not black) and biatorine, or black and lecideine, with proper margin, often obliterated, or urceolate and gyalectine. Apothecia internally without gonidia. Spermatia acicular, straight or crenate, or shortly cylindrical.

#### A. *Spores simple.*

* *Thallus squamulose or verrucoso-squamulose.*

† *Hypothecium pale or colourless.*

1. *L. decipiens*, Ehrh. *reddish-flesh-coloured, squamose, squamules appressed, rotundo-lobate* or crenate, *flattish*, smooth, scattered, *margins sub-flexuose, upturned, white as well as the under surface, (K—C—); apothecia marginal*, adnate, plano-convex, black, margin thin, paler, entire, soon obliterated; hypothecium pale; spores 8, colourless, ellipsoid, simple, about 2½ longer than broad; I blue.

On the earth among calcareous rocks, not common.

SYN :—Ehrhart in Hedw. Stirp. Crypt. 2. 7. (1789.) Ach. Syn. 52. Nyl. Scand. 214. Mudd Man. 171.
FIG :—E. Bot. 870. Hepp Sporen t. 14. f. 120.
EXS :—Anzi It. S. 240. Anzi Ven. 56. Welw. Lusit. 95. Mass. 70. M. & N. 58. Schær. 164. Leight. 334.

GEOG. DISTRIB :—Italy, Switzerland, Pyrenees, Sweden, Norway, Bavaria, Portugal, Algeria, Texas.
BOT. PROV :—4...7...11...15.
ENGLAND :—Gogmagog Hills, Cambridge. *Rev. R. Relhan.* Teesdale, Durham. *Rev. J. Harriman.*
SCOTLAND :—Highlands. *Messrs. Stuart & Don.* Ben Lawers. *Dr. Maingay.* Killin and Clova. *Rev. J. M. Crombie.*
WALES :—Gogarth ! Great Orme's Head.
The hypothecium which is very pale-fuscous rests on a white upraised prominence of the thallus. Paraphyses concrete, apices fuscous. Spermatia straight, minute, sterigmata sub-simple. "Spores 13—15 mm. long, 3 times as long as broad." (*Hepp.*) "0.012—16 mm. long & 0.005—7 mm. broad." (*T. M. Fries.*) ".003 in. long, by .00125 in. broad." (*Mudd.*) Medulla I—.

2. *L. globifera*, (Ach.) *fusco-rufous* or *castaneo-rufescent*, *squamose*, *squamules reniform*, *imbricated*, *rigid*, somewhat shining, *rimoso-inculpted*, lobate, flexuose, subhorizontal, *thickened at the margins*, concolorous or paler beneath (K— C—); apothecia fuscous or black, elevated, convex and globose, immarginate, pale within, solitary or aggregate; spores 8, colourless, ellipsoid, simple.

On earth in sub-alpine calcareous localities, rare.

SYN :—Ach. L. U. 213. (1810.) Syn. 51. Nyl. Scand. 193.
FIG :—Hepp Sporen t. 57. f. 489. Sturm D. Fl. t. 26.
EXS :—Zw. 5. Hepp 489. Schær. 158. Th. M. Fries 40. Anzi Langob. 263. Smrft. 53.
GEOG. DISTRIB :—Scandinavia, Norway, Sweden, Bavaria, Switzerland, Lombardy.
BOT. PROV :—7...14.
SCOTLAND :—Arthur's Seat, Edinburgh; Pentland Hills. *Dr. Maingay.*
WALES :—Great Orme's Head !
The hypothecium is thin and fuscescent and rests on a white globose upraised prominence of the thallus. Hymenium pale-brownish, paraphyses cohœrent, rufo-fuscescent at the incrassate apices; gelatina hymenea I violet deep-blue then rufo-fuscescent. "Spores 0.012—15 mm. long, 0.005 mm. broad." (*Nyl.*); "9—13 mikrom long, 2—2½ longer than broad." (*Hepp.*); "0.012—15 mm. long, 0.005—6 mm. broad." (*T. M. Fr.*); ".0015 in. long, by .00075 in. broad." (*Mudd.*) .010—.013 mm. long, .005—006 mm. broad.

forma *rubiformis*, (Whlnb.) *squamules pale brown*, imbricate, erect, *margins* and under surface *whitish.*

On the earth in alpine places, rare. 1864.

SYN :—Whlnb. Fl. Lapp. 479. (1812.) Ach. Syn. 42. Nyl. Scand. 193.
EXS :—Th. M. Fries 39. Anzi Langob. 137.
GEOG. DISTRIB :—Norway, Sweden, Lombardy.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers ! *Mr. Carroll.*
Thallus K—C— ; medulla I—. The structure of the apothecium is precisely similar to that of *L. globifera*, but the hymenium and hypothecium are more darkly fuscescent, and the spores are about one-fourth larger. Paraphyses cohœrent; chemical reaction nearly similar. "Spores 0.012—17 mm. long, and 0.005—7 mm. broad." (*T. M. Fr.*) Spores .016 mm. long, .007 mm. broad.

3. *L. Salweii*, Borr. *whitish* or *creamy-white*, tartareous, effuse or continuous, *squamulose*, *squamules depressed*, *tumid* or *granulose*, *bluntly lobed*, *appressed*, *unpolished*, *minutely innato-granulate*, (K yellow C red); *apothecia* sessile, solitary or clustered, plane, *lurid umber-brown*, *pruinose*, *margin paler*, thin, elevated, *flexuose; hypothecium pale;* spores 8, colourless, ellipsoid, simple, large, twice as long as broad.

On earth among rocks, frequent. 1825.

SYN :—Borrer ! in E. Bot. Suppl. 2861. (1841.) T. M. Fries Scand. 449. *Biatora Wallrothii*, Korb. Syst. 193. Mudd 154.

FIG :—E. Bot. Suppl. 2861.

EXS :—Zw. 78. Anzi Langob. 171. Larbal. 32.

GEOG. DISTRIB :—Germany, Switzerland, Lombardy, Arctic America, Norway.

BOT. PROV :—1, 2,...6, 7...19...31.

ENGLAND : —Near Sennen, Cornwall. *Mr. Ralfs.* Valley of Rocks at Linton, N. Devon ! *Mr. Borrer.* Trevithal Moor ! near Penzance. *Mr. Curnow.* Plymouth. *Mr. Holmes.*

IRELAND :—Priest Leap Mountain near Dunkerron. *Dr. Taylor.*

WALES :—Craig Breidden, Montgomeryshire. (1825.) ; near Drws y Nant Isaf ; Road from Bala to Dolgelley ; Gelli-rhûdd near Barmouth. *Rev. T. Salwey.* Twll-dû. *Mr. Borrer.* Crib Coch ! Snowdon. Pen Cow ! near Fishguard, Pembrokeshire.

CHANNEL ISLANDS :—Saints Bay Guernsey ! *Rev. T. Salwey.* Beauport Bay, Jersey ! *Mr. Larbalestier.*

Medulla of thallus I— ; paraphyses distinct, slender and entangled. Disk of apothecium K—C red. Gelatina hymenea I brownish. Spores .021 mm. long, .011 mm. broad.

4. *L. atro-rufa*, (Dicks.) *lurido-cinerascent* or brownish, *adnato-squamulose, squamules depressed,* or *sub-verrucose* or *sub-imbricate, (K—C—); apothecia fuscous* or *nigricant, adnate,* plano-convex, margin thin, soon obliterated ; *hypothecium colourless,* the sides externally dark-brown ; spores 8, colourless, ellipsoid, simple ; gelatina hymenea I bright-blue.

On earth among sub-alpine rocks, not unfrequent.

SYN :—Dicks. Br. Crypt. 4. 22. (1810.) Ach. Syn. 51. Nyl. Scand. 198. Mudd 171.

FIG :—E. Bot. 1102. Hepp Sporen t. 15. f. 122. Dicks. l. c. t. 12. f. 4.

EXS :—Hepp 122. Th. M. Fries. 41. Schær. 171. Fellm. 151. Anzi It. S. 238.

GEOG. DISTRIB : — Germany, Denmark, Norway, Sweden, Switzerland, Austria, E. Lapland, Hungary, Italy.

BOT. PROV :—5, 6, 7...10, 11, 12...19...22...31.

ENGLAND : — Penrith Fell, Cumberland. *Mr. Dickson.* (1801.) Eglestone ! Durham. *Rev. J. Harriman.* Farndale Moor, Yorkshire. *Mr. Mudd.* Caer Caradoc ! Shropshire.

SCOTLAND :—Ben Lawers ; Lochnagar ; Ben Macdhui ; Bennaboord. *Rev. J. M. Crombie.* Ben Lawers ; Crainlarich. *Dr. Holl.*

IRELAND :—Mount Douce, Wicklow. *Adm. Jones.*

WALES :—Cwm Glas ! Snowdon. Fort Hill ! near Fishguard, Pembrokeshire.

CHANNEL ISLANDS :—Guernsey. *Rev. T. Salwey.*

Paraphyses compact, incrassate and fuscous at the apices. "Spores 0.010—17 long, 0.006—8 mm. broad." (*Nyl.*) "9—13 mickrm. long, 2—2½ as long as broad." (Hepp.) "0.012—17 mm. long, 0.005—8 mm. broad." (*T. M. Fr.*) ".002—.0025 in. long, by .001 in broad." *(Mudd.)* Spores .014—.015 mm. long, .007 mm. broad.

5. *L. rhizbola*, (Nyl.) *castaneo-fuscous* or *lurido-fuscescent*, squamose, *squamules rigid, rotundate* or *rotundato-deformed*, crenate at the margin, under surface pale or whitish, unequal, *with long central radicles ;* apothecia nigricant, moderate, pale within ; spores 8, colourless, oblongo-ellipsoid, simple ; paraphyses indistinct ; gelatina hymenea vinous-red with iodine.

On the earth among rocks in alpine districts, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 4. Crombie En. 64.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7.

SCOTLAND :—Ben Lawers. *Adm. Jones.*

Allied to *L. globifera.* "Spores .012—16 mm. long, 006—7 mm. broad." (*Nyl.*)

6. *L. glaucolepidea*, (Nyl.) *glauco-virescent*, membranaceous, *squamulose*, *squamules* scattered, *ascending*, *rounded*, *margins inciso-lobate and crenate*, *sorediiferous*; *apothecia* large, adnate, solitary, *reddish-black*, *convex*, or cephaloid, depressed in the centre, margin obliterated; hypothecium thick, pale-brown; spores 8, colourless, ovate or elliptical, simple.

On mountain turfy ground, rare. 1812.

SYN :—Nyl. Enum. Gen. Suppl. 337. (1857.) Carroll in Nat. Hist. Rev. 1859. p. 326. Mudd Man. 171.
FIG :—Nat. Hist. Rev. 1859. t. 32. f. 2. 3. a. b. c. Mudd t. 3. f. 62.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...30.
IRELAND :—Near Bantry. *Miss Hutchins.* (1812.) South side of Crochan Mountain! 4 m. from Ballintoy co. Antrim. *Dr. Moore.*
Thallus like a Cladonia. "Spores .0015 in. long, by .005—.00075 in. broad." *(Mudd.)*

7. *L. armeniaca*, (DC.) *pale-ochraceo-lutescent*, *areolato-diffract*, *areolæ sub-squamoso-verrucose*, plane or subconvex, *smooth*, hypothallus bluish-black; apothecia innate, nearly plane, immarginate, moderate; hypothecium dusky or colourless; spores 8, colourless, ellipsoid or oblong, simple; (thallus K orange yellow, C red.)

On rocks, rare.

SYN :—*L. armeniaca var. aglæoides*, Nyl. Delp. in Bull. Soc, Bot. Fr. vol. 10. p. 265. (1863.) Crombie Enum. 83.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Craig Calliach, East Grampians. *Rev. J. M. Crombie.*
Paraphyses thick, short, distinct, but compact. Gelatina hymenea I intense blue. "Spores 0.009—0.013 mm. long, 0.005—0.006 mm. broad." (*Nyl.*) "0.009—0.013 mm. long, 0.004—5 mm. broad." *(T. M. Fr.)*

8. *L. confertula*, (Strtn.) *pallido-cinereous*, *squamuloso-crustaceous*, squamules small, contiguous or dispersed (K—C—); *apothecia fuscous*, nearly plane, *minute*, very numerous, *often contiguous*, obtusely margined, *internally pale*; spores 8, colourless, ellipsoid, simple; paraphyses not very distinct, almost conglutinate, fusco-clavate; *hypothecium colourless*; gelatina hymenea I blue then vinoso-violet especially the thecæ.

On rocks, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 86. (1875.)
BOT. PROV :—15.
SCOTLAND :—Near Killiecrankie. *Dr. Stirton.* (1875.)
"Spores .01—.013 mm. long, .0055—.007 mm. broad." (*Stirt.*)

9. *L. endocyanea*, (Stirt.) *cinereous or cinereous-black*, *or even black*, *squamuloso-diffract*, squamulæ plane or somewhat convex, appressed (K—C—); *apothecia fuscous-black*, at first small and urceolate, then expanded plane or convex and immarginate, sessile, *internally nearly all but especially upwards of a violet-colour*; *hypothecium slightly fuscescent or nearly colourless*; paraphyses distinct, filiform, closely intertwined at the apices; asci cylindrical, attenuate at the base; *spores* 8, *colourless*, *ellipsoid or oblongo-ellipsoid*, *simple*.

On rocks, rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. 165. (1877.)
BOT. PROV :—16.
SCOTLAND :—Mull. *Dr. Stirton.* (1877.)
"Spores .011—.014 mm. long, .006—.007 mm. broad. Gelatina hymenea I blue then flavescent and the asci fulvescent. The epithecium is overlaid with a dense granular darker layer." (*Stirt.*)

10. *L. sporeta*, (Stirt.) *whitish, disperso-squamulose, squamules* small, *appressed*, plane or somewhat convex and sometimes crenulate (K—C—) ; *apothecia fuscous or fuscous-black, very crowded, adnate*, plane, obtusely margined, somewhat shining, small ; *hypothecium colourless ;* paraphyses not well discrete, apices fuscescent ; *spores* 8, *colourless, ellipsoid, simple.*

On rocks, rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. 166. (1877.)
BOT. PROV :—16.
SCOTLAND :—Island of Mull. *Dr. Stirton.* (1877.)
"Spores .011—.015 mm. long, .005—.006 mm. broad. Gelatina hymenea I blue then fulvescent." (*Stirt.*)

11. *L. pissodes*, (Stirt.) *fusco-badious or fuscous-black, squamuloso-diffract*, squamules small, somewhat concave or plane, (K—C—) ; *apothecia black, crowded, innate*, small, plane, slightly margined ; *hypothecium colourless ;* paraphyses indistinct, irregular, slender, apices black or darkly-blue-black ; *spores* 8, *colourless, oblong, simple.*

On rocks, rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. 166. (1877.)
BOT. PROV :—16.
SCOTLAND :—Island of Mull. *Dr. Stirton.* (1877.)
"Spores .007—.01 mm. long, .0035—.0045 mm. broad. Gelatina hymenea I blue then fulvescent." (*Stirt.*)

†† *Hypothecium dark.*

12. *L. lurida*, (Swartz.) *lurido-fuscescent, imbricato-squamose, squamules rigescent, sub-horizontal, sub-orbicular, smooth, sinuato-lobate*, under surface white, (K—C—) ; apothecia nigro-fuscous, adnate, plane or convex, margin thin, flexuose, soon obliterated ; hypothecium thick, dark-brown ; spores 8, colourless, ellipsoid, simple.

On earth among calcareous rocks. 1793.

SYN :—Swartz Nov. Act. Upsal. 4. 247. (1784.) Ach. Syn. 51. Nyl. Scand. 192. Mudd Man. 170.
FIG :—E. Bot. 1329. Sturm D. Fl. t. 27. Hepp Sporen t. 14. f. 121.
EXS :—Anzi It. S. 239. Dicks. 25. Mass. 67. 68. Nyl. 131. M. & N. 643. Hepp 121. Schær. 157. Larbal. 31. Crombie 79. Reich. & Schub. 47.
GEOG. DISTRIB :—Sweden, Norway, Italy, Pyrenees, Hungary, France, Switzerland, Bavaria, Algeria.
BOT. PROV :—1...7...12...15...23...26...31.
ENGLAND :—Cumberland. *Mr. Dickson.* (1793.) Eglestone, Durham. *Rev. J. Harriman.* Middleton ! Teesdale. *Mr. Robertson.* Babbicombe ! *Mr. Borrer.* Buxton ; Malham. *Dr. Carrington.* Bathford Hill, Bath. *Dr. Holl.*
SCOTLAND :—Ben Lawers. *Adm. Jones.* Craig Guie, *Rev. J. M. Crombie.*
WALES :—Cellfawr, Barmouth ! *Rev. T. Salwey.* Eglwyseg rocks ! Great Orme's Head !
The excipulum is dark-brown, and horny in texture, inclosing a thick dark-brown medullary mass upon which the hymenium rests. Paraphyses densely cohœrent, apices rufescent. I brown with greenish hue, but Nyl. and T. M. Fr.

say I pale-blue then vinous-red. "Spores 0.013—15 mm. long, 0.006—7 mm. broad." (*Nyl.*)" 0.012—16 mm. long, 0.005—7 mm. broad." (*T. M. Fr.*) ".002 to .0025 in. long, by .001 to .00125 in. broad." (*Mudd.*) "9—15 mikrm long, twice as long as broad." (*Hepp.*) .010—011 mm. long. .006—.007 mm. broad. "Spermatia ellipsoid or sub-cylindrical." (*Mudd.*) The margins of the thalline squamules are generally thickened and sometimes slightly upturned. There is a paler state of the thallus, forma *pallescens*, Th. M. Fries Scand. 414.

13. *L. Friesii*, Ach. *brownish-olive*, cartilaginous, diffuse, *glebuloso-squamose, squamules scattered or crowded, convexo-gibbous, smooth and polished;* apothecia black, prominently sessile on the squamules, margin thickish, flexuose and incurved; hypothecium dark-brown; spores 8, colourless, ellipsoid, simple, minute; (thallus K—C—.)

On trees and palings, rare. 1854.

Syn :—Ach. in Liljebl. Sv. Fl. p. 610. (1816.) Nyl. Scand. 213. *L. myrmecina*, Fr. L. Ref. 344. *L. Caradocensis*, Mudd (non Leight.) Man. 169.

Fig :—Ann. and Mag. N. Hist. ser. 3. 14. t. 9. f. 8. 9. 11.

Exs :—Mudd 142. Fries 28.

Geog. Distrib :—Sweden, Norway.

Bot. Prov :—10.

England :—Farndale! Stogdale! Kildale! Baysdale! Cleveland; Yorkshire. *Mr. Mudd.*

Paraphyses coherent, apices fuscescent. "Spores 0.007—8 long, 0.003—4 mm. broad." (*Nyl.*) "0.006—8 mm. long, 0.003—5 mm. broad." (*T. M. Fr.*) ".0015 in. long, by .3075 in. broad. Spermogonia prominent, verrucæform, black, scattered or confluent. Spermatia ellipsoid or subcylindrical, straight." (*Mudd.*) Spores .007 mm. long, .004 mm. broad.

14. *L. ostreata*, (Hffm.) *pale-olive, squamulose, squamules imbricate, ascending* or *sub-erect, reniform, smooth, crenate, margins and under surface albo-granulato-pulverulent;* apothecia black, opake, plane, adnate, slightly glauco-pruinose, margin flexuose; hypothecium fuscous; spores 8, colourless, ellipsoid, simple, minute; (thallus K—C crimson.)

On trees and palings, frequent. 1805.

Syn :—Hoffm. D. Fl. 2. 163. (1795.) Nyl. Scand. 242. *L. scalaris*, Ach. Syn. 52. Mudd Man. 169.

Fig :—E. Bot. 1501. Mass. Ric. f. 195.

Exs :—Zw. 77. Mudd 141. Anzi It. S. 236. M. & N. 1326. Schær. 467. Leight. 50. Smrft. 134.

Geog. Distrib :—Germany, Sweden, Denmark, Norway, Bavaria, E. Lapland, Italy, Austria, Switzerland, Scandinavia.

Bot. Prov :—3, 4, 5...10.

England :—Near Halesworth, Suffolk. *Mr. Turner.* Eton. *Mr. Gotobed.* Henham, Suffolk. *Mr. Turner.* Oggeray Gill! Westerdale! Cleveland. *Mr. Mudd.* Thorndon Hall Park! Essex. *Mr. Piggott.* Hay Park! Herefordshire. *Rev. T. Salwey.* Ursenby! Yorkshire. *Mr. Baker.* near Worcester. *Dr. Holl.* Hendon; Finchley; Hampstead; Epping; Totteridge; near Lyndhurst, New Forest. *Rev. J. M. Crombie.* Keston Common, Penshurst, Sevenoaks, Kent. *Mr. Holmes.* Caer Caradoc! Eastern base of Wrekin! Haughmond Hill! Shropshire.

Medulla I—. Excipulum externally dark, internally pale. Paraphyses cohærent. "Spores 0.011—12 mm. long, 0.0025—0.0035 mm. broad." (*Nyl.*) "0.010—12 mm. long, 0.0020—35 mm. broad." (*T. M. Fr.*) "001 in. long, by .0005 in. broad." (*Mudd.*) "Gel. hym. I blue. Spermatia cylindrical, straight." (*T. M. Fr.*)

15. *L. mamillaris*, (Gouan) *white*, thick, tartareous, *verrucoso- or areolato-squamulose, areolæ sub-lobato-plicate, turgid and convex,*

*cancellato-insculpted* or rimose; *apothecia on the margins of the areolæ*, sessile, black, plane, naked, margin thin, eventually obliterated; hypothecium nearly black, thick; spores 8, colourless, elongato-ellipsoid, simple or obscurely bilocular; (thallus K—C—.)

On calcareous rocks, rare. 1791.

SYN :—Gouan Montp. 88. (1796.) Nyl. Prodr. 120. Mudd Man. 173.
FIG :—Linn. Trans. 1. t. 4. f. 3.
EXS :—Schær. 575. Mass. 29. Anzi It. S. 245.
GEOG. DISTRIB :—France, Algeria, Germany, Italy.
BOT. PROV :—1...8.
ENGLAND :—Babbicombe, Devon. *Adm. Jones.* Upton! near Torquay, Devon. *Dr. Deakin.* Dovedale. *Mr. Holmes.*

"Spores .0025 to .003 in long, by .00075 in. broad." (*Mudd.*) "4 to 5 times longer than broad." (*Körb.*) "Spermatia straight, minute, sterigmata nearly simple." (*Nyl.*) Spores .011—.014 mm. long, .004—.005 mm. broad.

16. *L. intumescens*, (Flot.) *fusco-cinereous* or *cervino-fuscescent*, determinate, *sub-squamoso-plicato-verruculose*, *areolato-diffract*; *apothecia* black, numerous, crowded, minute, *innato-appressed*, plane, *margin thin*, *prominent*, *flexuose*; hypothecium nigro-fuscous; spores 8, colourless, ellipsoid, simple.

In insulated patches between the thallus of *Lecanora glaucoma* on rocks, frequent. 1854.

SYN :—*L. badia v. intumescens*, Flot. Lich. Siles. No. 175. (1829.) Nyl. Scand. 231. *L. insularis*, Nyl. Bot. Not. 1852. p. 177. Mudd Man. 205.
FIG :—Mudd Man. t. 3. f. 76.
EXS :—Nyl. 58. Leight. 161. Mudd 174. Rabh. 749. Anzi Langob. 330.
GEOG. DISTRIB :—France, Sweden, Denmark, Lombardy, Austria, Westphalia.
BOT. PROV :—5, 6, 7...10...15.
ENGLAND :—Cliffrigg! Lounsdale! Cleveland. *Mr. Mudd.* Oakham Dingle! near Church Stretton; Pontesford Hill! Caer Caradoc! Shropshire.
SCOTLAND :—Portlethen, Coast of Kincardineshire. *Rev. J. M. Crombie.*
WALES :—Gimlet Rock! Pwllbelli. Fort Hill! near Fishguard. St. David's! Pembrokeshire.

Paraphyses indistinct with dark-fuscous apices, I pale-blue then dirty-violet. "Spores 0.010—12 mm. long, 0.005—6 mm. broad." (*Nyl.*) "0.010—13 mm. long, 0.005—6 mm. broad." (*T. M. Fr.*) ".0025—.003 in. long, by .001 in. broad." (*Mudd.*) .012 mm. long, .006 mm. broad.

17. *L. lugubris*, Smmrf. *fusco-cinereous*, *cartilaginous*, thickish, *squamuloso-areolate*, *granuloso-concrete*, *glebuloso-diffract*; *apothecia black*, opake, *superficial*, plane, *margin thick*, *entire*, hymenium cinerascent; hypothecium nigro-fuscous; *spores* 8, colourless, *sphærical*, simple, minutely multi-nucleolate.

On sub-alpine rocks, rare. 1856.

SYN :—Sommerfelt Suppl. Fl. Lapp. 143. pr. p. (1826.) Nyl.! Obs. Holm. 176. Scand. 232. 293. Lindsay in Micr. Journ. 5. 177. Mudd Man. 213.
FIG :—Micr. Journ. 5. t. 11.
EXS :—Fries L. S. 351. Mudd 183. Th. M. Fries 19. Crombie 91.
GEOG. DISTRIB :—Sweden, Norway, Finland, Bavaria, Prussia.
BOT. PROV :—10...15.
ENGLAND :—Old wall, East of Cook's Monument! Ayton, Cleveland. *Mr. Mudd.* Cronkley Scar, Yorkshire. *Mr. Martindale.*
SCOTLAND :—West of village of Braemar, co. Aberdeen. *Dr. Lindsay.* (1856.) Ben Lawers! *Mr. Hugh Macmillan.* Castleton! Braemar. *Adm. Jones.* Foot of Ben-y-gloe; Glen Fender; Craig Tulloch, Blair Athole. *Rev. J. M. Crombie.*

Paraphyses slender, distinct, slightly incrassate at the apices, I dirty-yellow. Spores uniseriate in the ascus, "diam. 0.008—9 mm." (*Nyl.*) "diam 0.008—9 mm." (*T. M. Fr.*) ".00175 in. diam." (*Mudd.*) diam. .008—.011 mm. "Sper-

mogonia very minute, punctiform or subverrucæform, slightly prominent, black, sparingly scattered. Spermatia straight, cylindrical, .00075 to .001 in. long by .00012 in. broad." (*Mudd.*)

18. *L. fuliginosa*. Tayl. *dark-brown* or *fusco-rufescent, glebuloso-squamulose, pulvinulo-conglomerate;* (K—C—.) *hypothallus* nigro-fuscous, *subbyssoid; apothecia* black, small, solitary or aggregate, *plano-convex, margin* thin, *soon obliterated*, internally blackish; hypothecium brownish-black, thick; spores 8, colourless, ellipsoid, simple, minute.

On rocks, frequent. 1836.

SYN :—Tayl. ! Fl. Hib. 2. 131. (1836.) *L. confusa*, Nyl. Scand. 216. Mudd Man. 208.
EXS :—Leight. 305.
GEOG. DISTRIB :—Sweden, Norway.
BOT. PROV :—5...7...15...19...26.
ENGLAND :—Caer Caradoc ! High Rock ! near Bridgnorth, Shropshire.
SCOTLAND :—Crianlarich. *Dr. Holl.*
IRELAND :—Dunkerron; Carig Mountains ! co. Kerry. *Dr Taylor.* (1836.) Glengariff; Dunmanway ! *Mr. Carroll.* near Kylemore ! Lettermore ! Doughruagh Mountain ! Galway. *Mr. Larbalestier.*
WALES :—Between 4 & 5 milestone between Barmouth and Dolgelley ! *Rev. T. Salwey*, Barmouth ! Cader Idris ! Llyn Geirionydd ! Glyder Vach !
Paraphyses pale-yellowish-brown, cohærent, apices brownish-black. "Spores 0.008—0.010 mm. long, 0.004—6 mm. broad." (*Nyl.*) "0.007—10 mm. long, 0.004—6 mm. broad." (*T. M. Fr.*) ".002 to .00275 in. long by .001 in. broad." (*Mudd.*) .007 mm. long, .004—.005 mm. broad. Asci I blue. "Spermatia filiform, arcuate." (*Nyl.*)

19. *L. botryiza*, Nyl. *cinereo-virescent, squamuloso-pulverulent, thin*, (K—C—); *apothecia pale-brown to dark-brown*, small, *simple, or aggregate*, prominent, *almost sphærical; hypothecium thick*, dense *brownish-black*; spores 8, colourless, elliptical, simple; *hymenium colourless, pellucid;* paraphyses not discrete, apices colourless; gelatina hymenea I cærulescent then vinous-red.

On alpine rocks, rare. 1871.

SYN :—Stirton in Grevillea 2. p. 71.
BOT. PROV :—15.
SCOTLAND :—Ben Voirlich. *Dr. Stirton.* (1871.)
"Spores .008 mm. long, .004 mm. broad." (*Stirt.*)

20. *L. endomelæna*, Leight. *pale cinereo-virescent*, opake, *glebulose, glebulæ scattered or areolato-diffract, thick, convex, composed of minute, conglomerate, convex, roundish or sub-lobate, subfurfuraceous squamules* (K pale-yellow C pale-yellow); *apothecia violet-black*, rather large, *innato-sessile*, at first plane with a thickish margin, afterwards very convex, and immarginate, *slightly pruinose, concolorous within; hypothecium very thick, nigro-fuscous, with a paler-brown enclosed intermediate stratum; spores* 8, colourless, small, *elongato-ellipsoid*, simple.

On stone walls, rare. 1874.

SYN :—Leight. in Linn. Trans. ser. 2. 1. p. 239.
FIG :—Linn. Trans. l. c. t. 32. f. 13 & 14.
BOT. PROV :—7.
WALES :—Trefriw ! near Llanrwst. (1874.) Moel-y-gest near Tremadoc !
A very distinct species. Hymenium palish-blue. I dense-violet. Paraphyses cohærent, apices fuscescent. Spores .0115—.0125 mm. long, .0045—.005 mm. broad.

* * *Thallus scurfy.*

† *Hypothecium dark.*

21. *L. dispansa*, Nyl. *black, thin, furfuraceous*, rimulose; *apothecia numerous, minute, scattered, sessile, black, plane, margin thin, smooth; hypothecium thin, nigro-fuscous*; epithecium nigro-fuscous; hymenium colourless; spores 8, colourless, ellipsoid, simple.

On water-washed sandstone boulders, in sub-alpine localities, rare. 1854.

SYN:—Nyl. in Flora 1866. p. 86. Nyl. Lapp. or. 186. *L. expansa*, Nyl. in Leight. Exs. 186. Mudd Man. 208.
EXS:—Leight. 186. Mudd 176. Zw. 426.
GEOG. DISTRIB:—Europe.
BOT. PROV:—5...7...10...19...26...31.
ENGLAND:—Near Battersby! and near Roseberry! Cleveland, Yorkshire. *Mr. Mudd.* near Bewdley, Worcestershire. *Dr. Holl.*
IRELAND:—Near Cork! *Mr. Carroll.* Glencorbot! *Mr. Larbalestier.*
WALES:—Cwm Idwal! Glyn Ceiriog! near Chirk.
CHANNEL ISLANDS:—Rozel, Jersey! *Mr. Larbalestier.*
Paraphyses distinct, but cohærent, apices nigro-fuscous. "Spores 0.007—0.010 long, 0.0035—0.0040 mm. broad." *(Nyl.)* ".00175 in. long, by .0005 in. broad. Spermatia minute, cylindrical or sub-ellipsoid." (*Mudd.*) Spores .010—.012 mm. long, .004—.005 mm. broad.
*L. dispansa* and *L. sylvicola* and its varieties approach each other closely, but attention to the characteristic features of their diagnoses will enable an easy and certain recognition.

22. *L. demarginata*, Nyl. *whitish* or *cinerascent*, very thin, *subleprose*; apothecia convex, similar in analysis to those of *L. dispansa*, Nyl. of which it may be a subspecies.

On rocks, rare. 1877.

SYN:—Nyl. in Flora 1878. p. 245.
GEOG. DISTRIB:—Europe, Finland.
BOT. PROV:—26.
IRELAND:—Kylemore. *Mr. Larbalestier.* (1877.)

23. *L. sylvicola*, (Flot.) *cinereous* or *pale-yellowish-tawny*, thin, *furfuraceous, rimulose*, effuse, (K—C—); *apothecia* black, small, *convex, immarginate, solitary* or 2-3-*connate*, colourless within; hypothecium violaceo-nigricant; hymenium cæruleo-cinerascent; *epithecium pale*; paraphyses indistinct; spores 8, colourless, ellipsoid, simple; gelatina hymenea vinous-red with iodine.

On maritime rocks, rare.

SYN:—Flot. Lich. Siles. No. 171. (1829.) Nyl. Lapp. or. 185. Crombie Enum. 69.
EXS:—Larbal. 84. Arn. 409. b.
GEOG. DISTRIB:—Germany, Sweden, Norway, Finland, Lapland Orient.
BOT. PROV:—1...7...26...31.
IRELAND:—Salrock Road! and Kylemore, Connemara. *Mr. Larbalestier.*
WALES:—Barmouth!
CHANNEL ISLANDS:—St. Peter's Valley, Jersey! *Mr. Larbalestier.*
Apices of paraphyses pale. "Spores 0.007—9 mm. long, 0.0035—0.0045 mm. broad. Spermatia slender, straight." *(Nyl.)* "0.006—8 mm. long, 0.0025—35 mm. broad." (*T. M. Fr.*) Spores .010 mm. long, .005 mm. broad.

Var. *infidula*, Nyl. whitish or pale-yellowish-tawny; apothecia nigricant, cinerascent within; hypothecium fuscous; paraphyses, spores and other characters as in type.

On maritime rocks, rare.

SYN:—Nyl. in Flora 1868. p. 475. Crombie Enum. 69.
GEOG. DISTRIB:—Europe.
BOT. PROV:—1...7...26...31.
ENGLAND:—Buckfastleigh, Devon. *Dr. Holl.*
IRELAND:—Twelve Pins. *Mr. Larbalestier.*
WALES:—Abertygwyn Dolgelley! *Dr. Holl.* near Builth!
CHANNEL ISLANDS:—The Warren! Jersey; St. Peter's Valley! Jersey. *Mr. Larbalestier.*

Var. *Hellbomii*, Lahm. dark-cinereo-fuscescent; apothecia black, turgescent, globose, immarginate, scattered colliculose, in conglomerations resembling the minute fruit of a bramble.

On rocks, not common.

SYN:—Lahm in Flora 1870. p. 177.
EXS:—Arn. 409 a.
GEOG. DISTRIB:—Norway, Sweden, Germany.
BOT. PROV:—7...10.
ENGLAND:—Lanbraugh-rigg! Cleveland. *Mr. Mudd.*
WALES:—Cwm Cywion! Nant Gwynant! Snowdon. Y-Fegle-fawr! near Barmouth.

24. *L. paucula*, Nyl. *albido-cinerascent*, thin, *furfuraceous*, effuse, (K—C—); *apothecia very black*, minute, scattered, *convex, immarginate;* hymenium dusky, cinerascent, paraphyses indistinct, apices colourless; *hypothecium thick, fusco-nigricant;* spores 8, colourless, lineari-oblong, simple, small.

On stones in streams, very rare. 1876.

SYN:—Nyl. in Flora 1876. p. 573.
BOT. PROV:—26.
IRELAND:—Near Kylemore! Connemara. *Mr. Larbalestier.*. (1876.)
"Spores .006–7 mm. long, .003 mm. broad. Gelatina hymenea I vinoso-fulvescent." (*Nyl.*) Spores .0145 mm. long, .004 mm. broad.

25. *L. sympathetica*, Tayl. *pale-brown*, sub-determinate, *tartareous, thickish*, plane, *rimuloso-areolate, furfuraceous, (K yellow C yellow); apothecia black*, numerous, distinct, small, *sub-innate, rugose, margin indistinct, rugose; hypothecium thick, black* or *brownish-black;* spores 8, colourless, ellipsoid, simple; paraphyses indistinct, epithecium fuscous.

On sandstone blocks in maritime localities, rare. 1831.

SYN:—Tayl. MS. in herb. Borrer! *L. prominula* β. Borr! E. B. Suppl. 2687. Hook. Br. Fl. 2. 176.
FIG:—E. Bot. Suppl. 2687. fig. 1. (2 left hand figs). Hepp Sporen t. 15. f. 130.
EXS:—Hepp 130. Arn. 23 & 45.
GEOG. DISTRIB:—Europe.
BOT. PROV:—2...5...7...19.
ENGLAND:—Rye! *Mr. Borrer.* Wenlock! Shropshire.
IRELAND:—Dunkerron! *Dr. Taylor in herb. Borrer.*
WALES:—Llandudno!
Spores .011 mm. long, .006 mm. broad.

26. *L. crustulata*, (Ach.) *pale-brownish* or *greyish*, very thin, tartareous, effuse, *slightly rimuloso-areolate*, furfuraceous, (K—C—); *apothecia very numerous*, scattered, sessile, plane, *black*, margin thin, entire; hypothecium thick, brownish-black; spores 8, colourless, oblong, simple; paraphyses indistinct, apices fuscous.

On sandstone rocks, rare.

SYN :—*Lecidea parasema var. crustulata*, Ach. Syn. 18. (1817.) *L. crustulata*, Mudd Man. 209. (1861).
EXS :—Mudd 177. Leight. 333.
GEOG. DISTRIB :—Hungary, Germany, Sweden.
BOT. PROV :—1, 2, 3...5...10...19.
ENGLAND :—Larch Bank ! near Ayton, Cleveland. *Mr. Mudd.* Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Wenlock ! Shropshire. (lignicole) Oaksey, Wilts. *Mr. Joshua.*
IRELAND :—Killcully ! Cork. *Mr. Carroll.* O'Donoghue's Prison ! Killarney. *Dr. Taylor.*
"Spores 0.014—15 long, 0.007—8 mm. broad." (*Nyl.*) "Spores 0.012—18 mm. long, 0.006—7 mm. broad." (*T. M. Fr.*) ".003—004 in. long, by .00125—0015 in. broad." (*Mudd.*) I blue, asci-brown. Spores .0165 mm. long, .008 mm. broad.

27. *L. trochodes*, Tayl. *rust-brown* thin, leproso-tartareous, *slightly rimose*, indeterminate; *apothecia black*, *small*, adnate, *roundish*, uneven, centrally umbonate or tuberculate, *margin tumid*, *uneven; hypothecium thick*, *black; spores* 8, *fuscous*, elliptico-oblong, simple, *large*; paraphyses indistinct.

On calcareous mountain rocks, rare. 1836.

SYN :—Tayl. Fl. Hib. 2. 259. (1836.) Leight. Brit. Graph. p. 13. (1854.) Grevillea 4. 25.
FIG :—Leight. Br. Graph. t. 5. f. 8. Grevillea 4. t. 52. fig e. f. g.
GEOG. DISTRIB :—Europe, Sweden, Norway, Finland.
BOT. PROV :—19.
IRELAND :—Carig Mountain ! co. Kerry. *Dr. Taylor in herb. Borrer.*
"Spores 0.018—30 mm. long, 0.011—16 mm. broad. I blue then intensely vinous-red. Spermatia cylindrical, straight." (*T. M. Fries* Lich. Scand. p. 531.) The large fuscous spores, double the size of those of *L. subgyratula*, Nyl. keep these plants distinct, .028 mm. long, .016 mm. broad.

28. *L. subgyratula*, Nyl. *blackish*, opaque, very thin, *subrimose*; *apothecia black*, *gyroso-rugose*, *minute*; hypothecium blackish; spores 8, colourless, oblong, simple, (half the size of those of *L. trochodes*, Tayl.); epithecium brownish; paraphyses slender, not discrete; gelatina hymenea I pale-bluish and then tawny-vinous-red.

On stones in alpine districts, rare. 1872.

SYN :—Nyl. in Flora 1873. p. 289—300. Grevillea 4. 25.
FIG :—Grevillea 4. t. 52. fig. a. b.
BOT. PROV :—15.
SCOTLAND :—Near Summit of Morrone ! *Rev. J. M. Crombie.* (1872.)
Looks like *Lecanora simplex*, but is allied to *Lecidea umbonatula*, Nyl. "Spores .012—16 mm. long, .008—10 mm. broad." (*Nyl.*) Spores .016 mm. long, .009—0095 mm. broad.

29. *L. subfurva*, Nyl. *brownish-black* or *greyish-brown*, *above minutely furfuraceous* and opake, *areolato-diffract*, indeterminate (K—C—); *apothecia black*, sessile, plane, *ruguloso-opake*, margined, *often angulose*, brownish within; epithecium brownish; hypothecium fusco-nigricant, thickish; spores 8, colourless. *subgloboso-ellipsoid*, simple; paraphyses slender, irregular, indistinct, thickened, branched and articulate upwards; gelatina hymenea intensely-blue with iodine.

On micaceous stone-walls. 1870.

SYN :—Nyl. in Flora 1872. p. 360. Crombie in Journ. Bot. n. s. 2. p. 360.
BOT. PROV :—15.
SCOTLAND :—Glen Fender and Craig Tulloch ! Blair Athole. *Rev. J. M. Crombie.* (1870.)

"Externally somewhat resembling *L. furvella*, but belonging to the section of *L. petrosa*. Spores .011—12 mm. long, .009 mm. broad." (*Nyl.*) Spores .012 –.013 mm. long, .0055—.007 mm. broad.

30. *L. ochracea*, (Hepp.) *ochraceo-fuscescent, thin, furfuraceous*, (K—C—); *apotheciablack* or *fuscous black*, plane, sessile, *with a thinner darker polished margin*; *hypothecium fulvo-fuscescent*, paler upwards; paraphyses indistinct, apices colourless; spores 8, colourless, lineari-oblong, simple.

On rocks, not common. 1876.

SYN :—Hepp Europ. 263.
FIG :—Hepp t. 29. f. 263.
EXS :—Hepp 263. Lojka Transylv. 2344.
GEOG. DISTRIB:—Germany, Transylvania.
BOT. PROV :—26.
IRELAND :—Near Kylemore and Mweelan! Ballinahinch! Twelve Pins! Connemara. *Mr. Larbalestier.* (1876.)
Spores .014 mm. long, .008 mm. broad.
f. *ecrustaca*. Ravine near Lough Feagh, Galway. *Mr. Larbalestier.* (1877.)

31. *L. pungens*, Körb. *whitish, furfuraceous*, thin, effuse, almost evanescent; *apothecia black*, plane, *crowded, with a black obtuse margin; excipulum black, thin; hypothecium pale-brownish;* paraphyses distinct, apices blackish; spores 8, colourless, broadly-oblong, simple.

On rocks, rare. 1876.

SYN :—Körb. Par. 161. (1865.)
GEOG. DISTRIB :—Germany, Sweden.
BOT. PROV :—26.
IRELAND :—Coast near Kylemore! Galway. *Mr. Larbalestier.* (1876.)
Spores .016–017 mm. long, .0095 mm. broad.

32. *L. picila*, (Mass.) *dirty-yellowish-white*, thin, effuse, *furfuraceous, farinose*; *apothecia black, sessile, plane or hemisphærical*-marginate, eventually obliterate; *when wetted transparent-pale-brown; hypothecium black*; paraphyses distinct, cohærent, apices pale; hymenium colourless; spores 8, colourless, *lineari-ellipsoid*, simple.

On rocks, rare. 1876.

SYN:—Mass. Misc. 38. (1856.)
EXS :—Arn. 73.
GEOG. DISTRIB :—Germany.
BOT. PROV :—26.
IRELAND :—Twelve Pins, Connemara. *Mr. Larbalestier.* (1876.)
Spores .013—.0155 mm. long, .004—005 mm. broad.

†† *Hypothecium fuscescent.*

33. *L. advertens*, Nyl. *olivaceo-nigricant*, indeterminate, thin, *furfuraceous, byssoid; apothecia black, minute*, at length sub-convex and immarginate, concolorous within; *hypothecium black* or *fuscous-black;* spores 8, colourless, ellipsoid, simple, small; paraphyses indistinct; gelatina hymenea cærulescent with iodine.

On calcareous alpine rocks, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 419.
GEOG. DISTRIB :—Europe.
BOT. PROV :—6, 7...26.

WALES :—Llyn Aran ! Cader Idris. (1866.) Cwm Idwal ! Cwm Bochlwyd ! Giltar Point ! Tenby.
IRELAND :—Bridge near Westport ! co. Mayo. *Mr. Larbalestier.*
"Spores 0.011—0.014 mm. long, 0.007—0.009 mm. broad." (*Nyl.*) Spores .007 mm. long, .003—.004 mm. broad.

34. *L. antrophila*, Larbal. *ochraceo-virescent*, thin, effuse, *pulverulento-furfuraceous*, (K—C—); *apothecia fulvo-rufescent*, small, scattered, *excessively convex* and prominent, sessile, *immarginate, a very pale narrow margin only appearing when wetted*; *hypothecium darkly-fulvo-rufescent*, thick; hymenium colourless: *paraphyses indistinct, apices colourless; spores* 8, *colourless, linear, or lineari-oblong, simple, very minute.*

On the interior of caves, rare. 1877.

SYN :—Leight. in Linn. Trans. 2d. ser. 1. 242.
FIG :—Linn. Trans. l. c. t. 33. f. 10 & 11.
BOT. PROV :—26.
IRELAND :—Mweelan ! near Kylemore, co. Galway. *Mr. Larbalestier.* (1877.)
A very remarkable and apparently distinct species. Gelatina hymenea I very-pale-blue. Spores .009 mm. long, .0025 mm. broad.

35. *L. polyantha*, Tayl. *pale-brown*, tartareous, *thinnish*, plane, *rimuloso-areolate, furfuraceous, (K yellow C orange-yellow); apothecia black*, small, *subinnate or innato-sessile, margin thick and very prominent*, entire; *hypothecium pale-rufescent; paraphyses distinct, apices pale*, I blue but asci brown; spores 8, colourless, ellipsoid or oblong, simple.

On sandstone blocks, rare.

SYN :—Tayl. MS. in herb. Borrer !
EXS :—Anzi Lich. Ital. Sup. 268. 269.
GEOG. DISTRIB :—Italy.
BOT. PROV :—2...7.
ENGLAND :—Hurstpierpoint ! *Mr. Borrer.*
WALES :—Festiniog road, Dolgelley !
Very similar generally to *L. sympathetica* and *L. crustulata*, but recognizable by different diagnoses. Spores .011—.012 mm. long, .007 mm. broad.

36. *L. rusticella*, Nyl. *ochraceo-whitish*, thin, subleprose; *apothecia black*, opake, *convex, immarginate, internally dark*; paraphyses indistinct; epithecium and hypothecium fuscous or fuscescent; spores 8, colourless, sub-oblong, simple.

On micaceo-schistose ferruginous rocks, rare. 1877.

SYN :—Nyl. in Flora 1878. p. 246.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1877).
"Spores .006—9 mm long, .0025—35 mm. broad. Gelatina hymenea I blue then vinoso-fulvescent or vinoso-subrufescent. To be compared with *L. rusticula*, Nyl. in Flora 1866. p. 371. from which it differs in the different thallus and smaller spores. It varies with a paler hypothecium." (*Nyl.*)

### ††† *Hypothecium colourless.*

37. *L. limosa*, Ach. *albido-cinerascent, subleprose*, thin, or furfuraceous, effuse, (K—C—); *apothecia black*, scattered or crowded and conglomerate; opake, naked, convex, subglobose, internally cinerascent, adnate; *hypothecium colourless or slightly-fuscescent*; spores 8, colourless, ellipsoid, or fusiformi-ellipsoid, simple.

On the earth in mountain ranges, rare. 1870.

SYN :—Ach. Syn. 26. (1817.) Nyl. Scand. 221. Crombie En. 75.
FIG :—Hepp. t. 57. f. 488.
EXS :—Schær. 195. Hepp 488. Anzi Langob. 183. Arn. 467. Crombie 90.
GEOG. DISTRIB :—Switzerland, Norway, Sweden, Lapland.
BOT. PROV:—15.
SCOTLAND :—Ben Lawers; Ben Macdhui; Summit of Cairn Gowar. *Rev. J. M. Crombie.*

Paraphyses thickish, numerous, distinct, but cohærent, bluish, apices pale. I bluish then dirty-fulvescent. The thallus generally of a loose furfuraceous character, the pale-fulvescent hypothecium, the distinct paraphyses with pale apices, distinguish it from its allies *L. assimilata*, Nyl. (Fellm. 164. 165. & 166.) and *L. alpestris*, Smrft. both of which have a distinct granular thallus, and the former has a dark-fuscescent hypothecium, turned nearly black by K, with few indistinct paraphyses, fuliginous at the apices, whilst the latter has a pale-fulvescent hypothecium with distinct paraphyses, fuliginous at the apices, and spores double in length. "Spores 0.011—18 mm. long, 0.004—6 mm. broad." (*Nyl.*); "0.009—18 mm. long, 0.004—6 mm. broad." (*T. M. Fr.*) Spores .012—.013 mm. long, .0055 mm. broad.

38. *L. lutulata*, Nyl. *yellow-ochraceous*, thin, leprose or indistinct; *apothecia greenish-black, convex, immarginate*, pale within; hypothecium colourless; epithecium bluish; paraphyses not discrete; spores 8, colourless, *ellipsoid or oviform*, simple; gelatina hymenea bluish and then tawny-wine-red with iodine.

On maritime rocks, very rare. 1873.

SYN :—Nyl. in Flora 1873. p. 297.
BOT. PROV :—31.
CHANNEL ISLANDS :—Rozel meadow, Jersey! *Mr. Larbalestier.* (1873.)

The specimen communicated by Mr. Larbalestier does not agree with Dr. Nylander's description in Flora, and has gonidia in the pale hypothecium. Spores .009—.010 mm. long, .004—005 mm. broad.

39. L. *phyllodisca*, Strtn. *black, minutely granulose or scurfy*, thin, often scarcely visible; *apothecia black*, moderate, often 2-3-*aggregate, and then undulate, sometimes conglomerate, margin shining*, thin, flexuose or sinuose, internally pallido-cinerascent or cæruleo-cinerascent *(K purpurascent or rosy)*; spores 8, colourless, ellipsoid, simple; paraphyses distinct, nigro-clavate or cæruleo-nigro-clavate; *hypothecium concolorous or sometimes darkly (1—4) zonate*; gelatina hymenea I slightly-blue then vinoso-fulvescent or sometimes vinoso-violet; hymenium and hypothecium purpurascent with nitric acid.

On rocks, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 86. 1875.
SCOTLAND :—Near Killicrankie. *Dr. Stirton.* (1875.)

"Spores .007—.009 mm. long, .0045—.0055 mm. broad. Allied to *L. phylliscocarpa*, Nyl. Beneath the apothecia are often seen curious cushions composed of yellowish granular matter." (*Stirt.*)

40. *L. chondrodes*, Mass. *white*, thick, *amylaceo-tartareous, plicato-rugose, nigrescent, furfuraceous*, (K—C—); *apothecia nigro-fuscous* when *dry, subsanguineous and transparent with a dark circumferential ring when wet, foveolato-innate, or adnato-sessile*, plane, with a thin nigrescent margin; *hypothecium colourless or slightly-fuscescent, with a narrow fuscous excipulum;* paraphyses conglutinate, apices fuscous; *spores* 8, colourless, *narrowly-ellipsoid*, simple, *large, oleoso-guttate.*

On calcareous rocks, not common, 1876.

SYN :—*Biatora*, Mass. Symm. 39. (1855.) Korb. Par. 8.
EXS :—Anzi 246. Arn. 186. 196 b.
GEOG. DISTRIB :—Germany, Italy, Sweden, Norway.
BOT. PROV :—1.
ENGLAND :—Yatton, Somerset. *Mr. Joshua.* (1876)
Gelatina hymenea I pale-blue then reddish-brown. Spores .017—.022 mm. long, .007—.009 mm. broad. Spores double the size of those of *L. immersa.*

41. *L. dilutiuscula*, Nyl. similar to *L. infidula*, Nyl. but the *apothecia* are *livid* or *livid-pale* and *entirely pale within*; epithecium and hypothecium colourless; paraphyses distinct; spores 8, colourless, ellipsoid, simple.

On maritime schistose rocks.

SYN :—Nyl. in Flora 1876, p. 308.
BOT. PROV :—1...26.
ENGLAND :—Devonshire. *Dr. Holl.*
IRELAND :—Near Renvyle House! Connemara. *Mr. Larbalestier.*
"Spores .007—.010 mm. long, .004–6 mm. broad." *(Nyl.)* Spores .008 mm. long, .004 mm. broad.

42. *L. chloroticula*, Nyl. *virescent, very thin, subleprose or scurfy*; *apothecia whitish-flesh-colour*, plane, very minute, *with a whitish margin*; hypothecium colourless; paraphyses not well discrete; *spores* 8, *colourless, acicular, slender, simple.*

On micaceo-schistose stones in a stream, very rare. 1877.

SYN :—Nyl. in Flora 1877. p. 564.
BOT. PROV :—26.
IRELAND :—Kylemore! Galway. *Mr. Larbalestier.* (1877.)
Gelatina hymenea I vinous-red. Spores .020—35 mm. long, .001 mm. broad. Spermatia arcuate, .030—40 mm. long, .0008 mm. broad." (*Nyl.*)

43. *L. orphnæilla*, Stirt. *black, opake, minutely granuloso-furfuraceous, continuous; apothecia black*, sessile, plane or somewhat convex, opake, *margin somewhat shining, often flexuose or irregularly-lobate, or even lobato-incised, internally pellucid*; *hypothecium colourless*; paraphyses rather thick, not well distinct, generally conglutinate; *spores* 8, *colourless, oblong or fusiformi-oblong, simple.*

On rocks, rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. 166. (1877).
SCOTLAND :—Mull. *Dr. Stirton.* (1877.)
"Spores .013—.018 mm. long, .003—.004 mm. broad. Gelatina hymenea I intense-blue almost black. Epithecium thick, black, $NO_5$ darkly violascent, K—." (*Stirt.*)

*** *Thallus powdery.*

44. *L. lucida*, Ach. *citrine-yellow* or virescent, thin, effuse, *leproso-pulverulent* (K yellow C—); *apothecia* minute, *pale-waxy-yellow*, plane or convex, immarginate; spores 8, colourless, oblongo-ovoid or narrowly obovate, simple, minute; gelatina hymenea cærulescent, then vinous-red with iodine.

On shady rocks, and stone walls, common. 1803.

SYN : –Ach. Prodr. 39. (1798.) Syn. 48. Nyl. Scand. 195. Mudd Man. 193.
FIG :—E. Bot. 1550. Ann. & Mag. Nat. Hist. Feb. 1857. t. 8. f. 10. 11. 12. 13. Mass. Ric. f. 249.
EXS :—Zw. 92. Schær. 225. Larbal. 36. Anzi Langob. 123.
GEOG. DISTRIB :—Sweden, Norway, Finland, Denmark, Silesia, Switzerland, Germany, Lombardy, Russia.

BOT. PROV :—2, 3...5...7...9...15...19...31.
ENGLAND :—Woolton, Allerton, &c. near Liverpool. *Sir. J. E. Smith.* (1803.) Cuckfield, Sussex ; Tunbridge Wells. *Mr. Borrer.* Oswestry ! Shropshire. *Rev. T. Salwey.* Cavley Bridge road, Exeter. *Mr. Parfitt.* near Knightsford Bridge, Worcestershire ; Croesfaen near Monmouth. *Dr. Holl.* Minehead, Porlock, Ightham, Kent. *Mr. Holmes.* Haughmond Hill ! Nesscliffe Hill ! Llanymynech Hill ! Shropshire.
SCOTLAND :—Blair Athole ; Falls of Tummel, Glen Fender. *Rev. J. M. Crombie.*
IRELAND :—Castlebernard Park. *Mr. Carroll.*
WALES :—Garth near Dolgelley. *Dr. Holl.* between Bala and Dolgelley ! Talyllyn Pass ! Cader Idris.
CHANNEL ISLANDS :—Rozel Manor ! Jersey ; Guernsey ; Sark. *Mr. Larbalestier.*
"Spores .004—7 mm. long, .0015—25 mm. broad." (*T. M. Fr.*) "Spores .0015 in. long, .0005 in. broad." (*Mudd.*) "Spores .004—6 mm. long, .0025—.003 mm. broad."

forma *theiotea*, (Ach.) a state differing from the type merely in its different habitat on earth, mosses, sticks and bark.

SYN :—Ach. Syn. 48.
FIG :—Hepp Sporen t. 56. f. 464.
EXS :—Zw. 92 B. Hepp 464. Leight. 385.
GEOG. DISTRIB :—Germany.
BOT. PROV :—5...7...15.
ENGLAND :—High Rock ! Bridgnorth, Shropshire.
SCOTLAND :—On a putrid trunk near the Falls of Tummel. *Rev. J. M. Crombie.* (1871.)
WALES :—Cader Idris !

45. *L. clavulifera*, Nyl. cinereo-virescent or subflavovirescent, thin, subdisperso-granulate or subleprose ; apothecia dirty-ochraceo-rufous or dirty-testaceo-rufescent or nigricant or black, convex; epithecium and hypothecium pale ; paraphyses indistinct ; spores 8, colourless, oblong or clavate, simple, most minute, .004—6 mm. long, .001 mm. broad ; gelatina hymenea I blue then vinoso-fulvescent.

On roots of trees, rare.

SYN :—Nyl. in Flora 1869. p. 294.

forma *subviridans*, Nyl. *subvirescent ;* gonidia small, glomeruloso-connate.

On rocks, rare. 1869.

SYN :—Nyl. in Flora 1877. p. 463.
BOT. PROV :—26.
IRELAND :—Kylemore, Glencorbot, Doughruagh, Galway. *Mr. Larbalestier.* (1869.)

**** *Thallus granulate.*

† *Hypothecium colourless.*

46. *L. prominula*, Borr. *pale-tawny-brown*, determinate, somewhat tartareous, thin, *minutely granulate*, (K yellow C yellow) ; *apothecia black*, numerous, crowded but distinct, small, sessile, *plane, opake, margin obtuse, entire*, slightly flexuose and polished, internally grey or pale-brownish ; *excipulum nigro-fuscous, lateral only ; hypothecium colourless ; spores* 8, colourless, elliptico-oblong, *simple.*

On flints, not common.

SYN :—a. Borrer! in E. Bot. Suppl. 2687. (1831.) Hook. Br. Fl. 2. 175. Mudd Man. 203.
FIG :—E. Bot. Suppl. 2687. fig. 1. (2 right hand figs).
EXS :—Arn. 4116. Richardson 150.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—1, 2,
ENGLAND :—Sussex Downs! *Mr. Borrer.* Exmouth; Haldon, Devon. *Mr. Parfitt.*
"Spores .00275—.003 in. long, by .0015 in. broad." (*Mudd.*) Spores .0115—.014 mm. long, .006—.007 mm. broad. Paraphyses pale, distinct, thickish, apices nigro-fuscous. I pale-vinous-red.

47. *L. parissima*, Nyl. *cinereo-virescent*, thin, *granulose*, effuse; *apothecia black*, *innato-sessile*, numerous, minute, scattered, simple or congregate, *plano-convex*, *internally pale*, margin obliterated; *hypothecium pale* or merely a thin brown line; paraphyses distinct; *spores* 8, colourless, oblong or fusiformi-oblong, simple, minute; gelatina hymenea vinous-yellow with iodine.

On old palings, rare. 1870.

SYN :—Nyl. in litt. 1870. Cromb. in Linn. Journ. 11. 484.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...5.
ENGLAND :—Golder's Green, Hendon! Middlesex. *Rev. J. M. Crombie.* (*May*, 1870.) Boreatton! Shropshire. *Mr. W. Phillips.* Sutton! Whitchurch!
"Allied to *L. denigrata*, Fr. but differing in reaction. Spermatia oblongo-cylindrical. Spores .007—.011 mm. long, .0025—.0035 mm. broad." (*Cromb.*) Spores .011 mm. long, .0035 mm. broad. An indistinct or obsolete septum is often visible and the hymenium is slightly cinerascent with K.

48. *L. flexuosa*, (Fries.) *virescent or viridi-cinerascent*, *granulose*, effuse, thin (Ky or—C red); *apothecia black*, plane, scattered, sessile, *margin thin*, *flexuose*, *hypothecium colourless*; *spores* 8, colourless, ellipsoid, simple, *minute*; gelatina hymenea dilutely cærulescent, then slightly fulvo-rubescent.

On old pines, wood, rails, &c., frequent.

SYN :—Fries L. E. 268. Nyl. Scand. 197. Mudd Man. 197.
FIG :—Hepp Sporen t. 56. f. 486.
EXS :—Nyl. 53. Hepp 486. Anzi Langob. 63. Crombie 80.
GEOG. DISTRIB :—France, Switzerland, Bavaria, Lombardy, Sweden, Scandinavia, Central Lapland.
BOT. PROV :—7...10...15.
ENGLAND :—Lounsdale; Kildale, Cleveland. *Mr. Mudd.* Hendon, Middlesex. *Rev. J. M. Crombie.*
SCOTLAND :—Killin. *Rev. J. M. Crombie.*
WALES :—Chirk Castle Park! Denbighshire.
"Spermatia very slender, cylindrical, straight. Spores .0015 to .002 in. long, by .0005 to .00075 in. broad." (*Mudd.*) "Spores 0.007—8 mm. long, 0.0035—45 mm. broad." (*Nyl.*) "Spores 0.007—9 mm. long, 0.0030—45 mm. broad." (*T. M. Fr.*) Paraphyses indistinct, apices brownish.

forma *æruginosa*, (Borr.) granules of thallus dissolved into dark-verdigris-green powder, and forming a rimoso-diffract crust (K yellow C red).

On decaying rails and trees, not common. 1831.

SYN :—Borrer in E. Bot Suppl. 2682. (1831.) Mudd Man. 197.
FIG :—E. Bot. Suppl. 2682.
EXS :—Leight. 406.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...5...8...10 ..20.
ENGLAND :—Sussex! *Mr. Borrer.* (1831.) Leicestershire. *Rev. A. Bloxam.* Ayton Moor! Stogdale! Baysdale! Cleveland. *Mr. Mudd.* near Treflach Hall!

Oswestry, Shropshire. *Rev. T. Salway.* Dunsford, Devon. *Mr. Parfitt.* Bromsgrove Lickey, Warwickshire; near Shrewsbury! Worfield! Shropshire.
IRELAND:—Glanmire! Cork. *Mr. Carroll.*
Spores .0095 mm. long, .005 mm. broad.

49. *L. conglomerata*, Fr. *pale-green* or greyish-green, *granulose*, thin, effuse, (K—C—); apothecia *minute*, very numerous, solitary or *conglomerate*, *convex*, pale-brown or reddish-brown, immarginate; hypothecium colourless, only slightly yellowish-brown in the lower portion; spores 8, colourless, narrow, cylindrical or oblongo-cylindrical, simple.

On trees, not common.

SYN:—Fries S. V. S. p. 112. (1846.) Mudd Man. 194.
EXS:—Leight. 151.
GEOG. DISTRIB:—Europe.
BOT. PROV:—2...8.
ENGLAND:—Gopsall! Leicestershire. *Rev. A. Bloxam.* Shanklin! Isle of Wight. *Rev. T. Salwey.*
"Spores .003 in. long, by .0075 in. broad. Spermogonia of same colour as, and immersed in thallodal granules. Spermatia cylindrico-acicular, curved." *(Mudd.)* Paraphyses distinct, but conglutinate, apices colourless. Spores .016 mm. long, .0025 mm. broad. I turns the apices of the paraphyses yellowish-brown, but has no effect on the hymenium.

50. *L. ochrococca*, Nyl. *lutescenti-ochraceous*, *granulose*, *effuse*, granules small, contiguous or sub-dispersed, firm, (K—C—); *apothecia rufous or rufescent*, plane, margin obtuse or indistinct, whitish within; hypothecium pale; *spores* 8, colourless, *oblongo-fusiform*, *simple*, *small*; paraphyses indistinct; gelatina hymenea I cærulescent then vinous-red, especially] the asci and apices of the paraphyses.

On pine trees, rare. 1861.

SYN:—Nyl. in Ofvers. V. Ak. Förk. 1860. p. 297; Scand. 206. Mudd Man. 194.
GEOG. DISTRIB:—Norway.
BOT. PROV:—15.
SCOTLAND:—Glenfalloch! *Mr. Carroll.* Inverouran. *Adm. Jones.* (1861).
"Spores 0.007—9 mm. long, 0.003—0.0035 mm. broad." *(Nyl.)* "Spores .0015—.002 in. long, .0005 in. broad." (*Mudd*) Spores very variable in size .006—.011 mm. long, 0025.—004 mm. broad.

51. *L. spododes*, Nyl. *greenish-yellow*, thin, *granulate*, some what evanescent, (K—C—); *apothecia cinerous or sordid-pale*, *small*, *convex*, *immarginate*; hypothecium colourless; spores 8, colourless, oblong, simple; gelatina hymenea blue then vinous-red with iodine.

On old pales, rare. 1869.

SYN:—Crombie in Seem. Journ. Bot. 7. p. 233. (1869.) Enum. 70. Linn. Journ. 11. p. 484.
GEOG. DISTRIB:—Europe.
BOT. PROV:—2, 3...5.
ENGLAND:—Near Lyndhurst! in New Forest. *Rev. J. M. Crombie.* (1869.) Shere! Surrey. *Dr. Capron.* Gaer Ditches!
WALES:—Near Dolgelley!
Closely allied to *L. denigrata*, Fr. and probably a sub-species, though externally distinct. "Spores .010—.014. mm. long, .0025—.0040 mm. broad, with K slightly or spuriously 3-septate." (*Crombie l. c.*)

52. *L. micrococca*, Körb. *dark-bright-green*, effuse, *minutely granulose*, (K—C—); *apothecia* minute, *carneo-lutescent*, innato-sessile,

*convex*, immarginate; hypothecium colourless; *paraphyses indistinct, conglutinate*, apices pale; spores 8, colourless, ellipsoid, simple, minute; gelatina hymenea I vinous or fulvescent.

On old holly stumps, rare. 1875.

SYN:—Körber Par. 155. (1865.)
EXS:—Zw. 416. Korb. 250. Rabh. 733. Arn. 279.
GEOG. DISTRIB:—Germany.
BOT. PROV:—26.
IRELAND:—Lough Inagh! *Mr. Larbalestier.* (1875.)
Spores .012 mm. long, .0045 mm. broad.

53. *L. decolorans*, Flk. *whitish* or *glauco-cinerascent*, thin, *incrusting*, effuse, *minutely granulose and leprose* or *pulverulent*, or *more largely granuloso-verrucose and smooth* (K yellow C red); *apothecia very variable in colour, form and size*, brick-reddish, cinereo-carneous, livido-fuscous, pallido-fuscescent, nigricant or fuscous-black, *scattered* or *conglomerate, appressed, plane*, and with a *flexuose* entire *margin*, or *convex and immarginate*, whitish within; spores 8, colourless, oblongo-ellipsoid, simple; paraphyses indistinct.

On the earth in hilly and sub-alpine localities, common. 1793.

The size of the thalline granules, and the colour of the apothecia are very variable, apparently resulting from locality and climatal influence. The chemical reaction (K yellow C red) might lead us to connect this with *L. coarctata, plebulosa*, &c., and perhaps they are all forms or states of one and the same lichen.

SYN:—Flk. in Berl. Mag. 1809. p. 193. Ach. Syn. 37. Nyl. Scand. 197. *L. quadricolor*, Dicks. Br. Cr. 3. p. 15. Mudd Man. 197.
FIG:—E. Bot. 1185.
EXS:—Leight. 352. Schær. 213. Mudd 165.
GEOG. DISTRIB:—Hungary, Switzerland, Brazils, Sweden, Russia.
BOT. PROV:—1, 2, 3, 4, 5...7...10, 11...15...19, 20...22, 23...26...30.
ENGLAND:—Lound near Yarmouth. *Mr. Turner.* Eggleston, Durham. *Rev. J. Harriman.* Cliffrigg! Baysdale! Stogdale! Guisbro' Moor! Cleveland. *Mr. Mudd.* near Penzance. *Mr. Curnow.* St. Paul's Cray, Ightham, Kent. *Mr. Howse.* Kelvedon, Essex. *Mr. Varenne.* Epping Forest; near Lyndhurst, New Forest. *Rev. J. M. Crombie.* Dartmoor. *Mr. Holmes.* Stiperstones Hill! Nesscliffe Hill! Shropshire.
SCOTLAND:—Scottish Mountains. *Mr. Dickson.* (1793.) Braemar. *Rev. J. M. Crombie.*
IRELAND:—Near Belfast. *Mr. Templeton.* Kerry. *Dr. Taylor.* near Bantry, *Miss Hutchins.* co. Wicklow. *Dr. Moore.* Doneraile Mountains, co. Cork. *Mr. Carroll.* Dublin Mountains. *Adm. Jones.* Delphi! Connemara. *Mr. Larbalestier.*
WALES:—Llyn Gwernan!
"Spores 0.009—0.016 mm. long, 0.004—6 mm. broad. Gel. hym. I slightly blue then slightly red." (*Nyl.*) "Spores 0.008—16 mm. long, 0.004—7 mm. broad. Gel. hym. pale-blue then violet or slightly fulvo-rubescent." (*T. M. Fr.*) "Spores .003—.0035 in. long, .00125 in. broad." (*Mudd.*) Spores .0115—.013 mm. long, .005—.006 mm. broad.

forma *escharoides*, (Ehrh.) granulose, (K y C red); *apothecia confluent, difformed, convex, immarginate*, fuscous or nigricant.

On peaty earth, frequent.

SYN:—Ehrh. Exs. 313. Ach. Prod. 77. L.U. 167. Mudd Man. 197.
FIG:—E. Bot. 1247.
EXS:—Rabh. 730. Anzi Langob. 170. Anzi Ital. Sup. 247. M. & N. 551. Leight. 59.
GEOG. DISTRIB:—Switzerland, Italy, Hungary, Sweden, Germany.
BOT. PROV:—5.
ENGLAND:—Stiperstones Hill! Arcoll Hill! Lawrence Hill! Shropshire.

forma *aporetica*, Kbr. *granules* of thallus *deliquescing* into a *leproso-pulverulent*, *condition*, (K y C red); apothecia varying in colour as in the type, margined or immarginate.

On peaty earth, frequent.

Not to be confounded with *L. gelatinosa*, (Flk.) which it externally resembles.
SYN :—Körber Syst. 193. (1855.)
EXS :—Mudd 166. Tuck. 45. Schær. 214. Crombie 81.
GEOG. DISTRIB :—Switzerland. N. America.
BOT. PROV :—2...5...10.
ENGLAND :—Cliffrigg! *Mr. Mudd.* Sussex! *Mr. Borrer.* Craigforda! near Oswestry, Shropshire. *Rev. T. Salwey.* Arcoll Hill! Long Mynd! Shropshire.

forma *saxatilis*, Larbal.

W. side of Lough Much, Galway. *Mr. Larbalestier.* (1877.)

54. *L. vernalis*, (L.) Ach. *whitish or albido-cinerascent*, very thin, *unequal* or *sub-granuloso-unequal* or evanescent, (K—C—); *apothecia rufous* or *pallido-rufous*, adnate, moderate, scattered or crowded, *convex*, *immarginate*, *palish within*; *spores* 8, colourless, oblong or ellipsoideo-oblong, *simple*; paraphyses indistinct; epithecium colourless.

On mosses, frequent.

SYN :—Linn. Syst. Nat. 3. p. 234. (1768.) Ach. Meth. 68. Syn. 36. Nyl. Scand. 200. Lapp. Or. 145.
EXS :—Fellm. 153. Tuck. 44. M. & N. 845.
GEOG. DISTRIB :—Scandinavia, Sweden, E. Lapland, Hungary, North America, N. Zealand, Switzerland.
BOT. PROV :—5...15...31.
ENGLAND :—Berrow! Malvern. *Mr. Lees.* Common in Shropshire!
SCOTLAND :—Ben Lawers; Bennaboord. *Rev. J. M. Crombie.*
CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*
"Spores 0.013—25 mm. long, 0.005—7 mm. broad. Spores 0.011—23 mm. long, 0.005—7 mm. broad. Gelatinea hymena I pale-blue then vinous-red." (*Nyl.*) "Spores 0.010—20 mm. long, 0.004—6 mm. broad." *(T. M. Fr.)* Spores .014—.0145 mm. long. .0045—.005 mm. broad.

forma *minor*, Nyl. apothecia much less in size (about one-fourth) than those of the type.

On trees, probably common. 1866.

SYN :—Nyl. Not. Sällsk. p. F. et Fl. F. Förh. xiii p. 335. Lapp. Or. 145 T. M. Fr. Lich. Scand. 428.
EXS :—Fellm. (sine num.) Arn. 417.
GEOG. DISTRIB :—E. Lapland, N. Zealand, Switzerland.
BOT. PROV :—5...7.
ENGLAND :—Llanymynech Hill! Shropshire (1871.)
WALES :—Near Dolgelley! (1866.)
"Spores 0.009—15 mm. long, 0.004—5 mm. broad." *(Nyl.)*

forma *subduplex*, Nyl. similar to the type, but with a few uniseptate spores mixed with the more numerous simple ones.

On mosses, &c. 1870.

SYN :—Nyl. Scand. 201. (1861.) Lapp. Or. 145. Crombie En. 68.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15...26.
SCOTLAND :—Central Counties. *Rev. J. M. Crombie.* (1870.)
IRELAND :—Opposite Leenane, Connemara. *Mr. Larbalestier.*
"Spores 0.011—17 mm. long, 0.0045—0.0055 mm. broad." *(Nyl.)*

55. *L. atrofusca*, (Hepp) *whitish* or *glauco-cinereous*, *leproso-granulose*, indeterminate; *apothecia luteo-fuscous or black*, adnate, plane or concave, *margin thickish*, *prominent*, *darker*, *shining*, eventually

convex, sub-immarginate; hypothecium colourless; spores 8, colourless, minute, ellipsoid, simple.

On moss, possibly frequent. 1877.

SYN :—Hepp Eur. 268. *Biatora vernalis*, Korb. S. L. 202. Par. 148.
FIG :—Hepp Sporen. t. 30 f. 268.
EXS :—Arn. 546. Anzi Langob. 180. Zw. 334 Hepp 238.
GEOG. DISTRIB :—Switzerland, Germany, Italy.
BOT. PROV :—26.
IRELAND :—South side of Kylemore Lake. *Mr. Larbalestier.* (1877.)

56. *L. accesitans*, Nyl. *whitish, nearly smooth*, dispersed or evanescent; *apothecia testaceous or testaceo-brownish, convex, immarginate, whitish within;* epithecium and hypothecium colourless; spores 8, colourless, oblong, simple; paraphyses indistinct; gelatina hymenea I bluish, then vinous-reddish.

On micaceous schist, rare. 1876.

SYN :—Nyl. in Flora 1876 p. 306, Flora 1877 p. 463.
BOT. PROV :—26,
IRELAND :—Renvyle; Doughruagh, Connemara, Galway. *Mr. Larbalestier.* (1876).

"Spores .009—.012 mm. long, .003—4 mm. broad. Spermogonia with arcuate thin spermatia .014—19 mm. long, .0005 mm. broad. Apparently belonging to the section of *L. vernalis.*" *(Nyl.)*

57. *L. æstivalis*, Ohl. *yellowish-green, granular*, evanescent, incrusting mosses; *apothecia brown, small, immarginate, with light-grey pruina;* hymenium and hypothecium colourless; spores 8, colourless, lineari-oblong, simple, .015—16 mm. long, .005—6 mm. broad; gelatina hymenea I blue then vinous-red.

On mosses, &c. 1876.

SYN :—Ohlert Lich. Preussen p. 16. (1870.)
GEOG. DISTRIB :—Prussia.
BOT. PROV :—26.
IRELAND :—Killery Bay, Galway. *Mr. Larbalestier.* (1876.)

Allied to *L. metamorphea, Nyl.* but differing in the simple spores and the firm (not soft peziza-like consistence) structure of the apothecia. Consociated with and somewhat resembling *L. vernalis* (L.)

58. *L. dubia*, Borr. *pallido-virescent*, thin, effuse, *minutely granuloso-pulverulent, rimulose*, (K yellow C orange red); *apothecia black*, moderate, scattered, or confluent, sub-immersed or sub-sessile, plano-convex, *margin soon obliterated, cærulescent within; hypothecium nearly colourless*, or very slightly fuscescent in the lower part, lateral excipulum bluish-black; spores 8, colourless, oblong, simple; *paraphyses distinct*, apices bluish-black; gelatina hymenea intense-blue with iodine.

On old palings, not common. 1813.

SYN :—Borrer in E. Bot. 2547. (1813.)
FIG :—E. Bot. 2547.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3, 4, 5.
ENGLAND :—Norfolk and around London. *Mr. Borrer.* (1813.) Overton! near Ludlow, Shropshire. *Rev. T. Salwey.* Essex! *Mr. Piggott.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Shere! *Dr. Capron.* Pevensey road, Eastbourne. *Mr. Roper.* Pembridge! Herefordshire. Pontesbury! Haughmond Hill! Shropshire.

Spores .0135 mm. long, .007 mm. broad.

59. *L. turgidula*, Fr. *whitish*, very thin, effuse, *minutely granu-*

*loso-* or *leproso-pulverulent, often evanescent; apothecia fusco-nigricant* or fusco-rufescent, *slightly cæsiopruinose*, small, plane, or convex, immarginate, solitary or congregate, sub-innato-sessile; *hypothecium yellowish-pale-brown;* paraphyses indistinct, apices brownish; spores 8, colourless, ellipsoid or ellipsoideo-oblong, simple, small; gelatina hymenea intense blue then violet with iodine.

On pine trees and old wood, not common.

SYN:—Fr. Sched. Crit. 1. p. 10. (1824.) Nyl. Scand. 201. Mudd Man. 201.
EXS:—Fries 25. Nyl. 142. Mudd 171. Anzi Venet. 74. It. S. 273. Crombie 83. Rabh. 809. Arn. 277.
GEOG. DISTRIB:—Sweden, France, Italy, Arctic America, Scandinavia, E. Lapland.
BOT. PROV:—2...5, 6...10...15.
ENGLAND:—Baysdale! Cleveland. *Mr. Mudd.* New Forest. *Rev. J. M. Crombie.* Shropshire!
SCOTLAND:—Killin and Lochaber. Pass of Killiecrankie. *Rev. J. M. Crombie.*
WALES:—Builth!
"Spores .0015—.002 in. long, 0.005—.00075 in. broad." *(Mudd).* "Spores 0.006—12 mm. long, 0.003—5 mm. broad." *(T. M. Fr.)* "Spores 0.007—0.012 mm. long, 0.0035—0.0055 mm. broad." *(Nyl.)* Spores .007—.008 mm. long, .0035—.004 mm. broad.

Var. *pithyophila*, (Smrft.) cinerascent, very thin, or evanescent; apothecia crowded minute, convex, rugulose, immarginate, internally fuscous.

On old fir pales. 1872.

SYN:—Smrft. Lapp. 154 (1826.) Crombie in Journ. Bot. n. s. 2. 134.
GEOG. DISTRIB:—E. Lapland.
BOT. PROV:—15.
SCOTLAND:—Glen Fender, Blair Athole and Killin. *Rev. J. M. Crombie.* (1872.)
"From this *L. endopella*, Leight. Lich. Fl. 301 differs chiefly in the hymeneal gelatine being of a beautiful blue colour with iodine." (*Crombie l. c.*)

Var. *endopella*, (Leight.) *evanescent; apothecia black*, numerous, crowded, *plano-depressed, margin obliterated, internally pallido-fuscous; hypothecium pallido-fuscous; spores* 8, colourless, *very minute*, ellipsoid, *simple, with 2 rather large nuclei.*

On old fir palings, rare. 1870.

EXS:—Crombie 84.
SCOTLAND:—Blair Athole! *Rev. J. M. Crombie.*
This comes very near to Schær. 529, but in that the spores are larger, and linear-oblong, without nuclei; nevertheless both may be only states of the same lichen. Spores .009—.0095 mm. long, .0045 mm. broad.

60. *L. prasina*, (Fries) *dull-green* or yellowish-green, *minutely granuloso-pulverulent*, effuse; *apothecia minute*, hemispherical, *livid-brown or nigricant, immarginate;* hypothecium pale-yellowish-brown; paraphyses conglutinate, apices pale; spores 8, colourless, oblong, simple.

On trees towards the bases, not uncommon.

SYN:—*Micarea prasina*, Fr. S. O. V. 257. (1825.) Mudd Man. 196.
EXS:—Mudd 164. Zw. 9.
GEOG. DISTRIB:—Switzerland, Germany, Bavaria.
BOT. PROV:—5...10.
ENGLAND:—Hoggarts Wood! Ingleby, Cleveland. *Mr. Mudd.* Wapley Hill! Herefordshire. Castle Hill Plantation! near Acton Scott, Shropshire.
"Spores .002—.0025 in. long, .001 in. broad." (*Mudd.*) "Spores 0.007—10

mm. long, 0.003—5 mm. broad. Gel. hym. I blue then vinous-red. Spermatia shortly acicular, straight, 0.008—10 mm. long." *(T. M. Fr.)* Spores .01 mm. long, 004 mm. broad.

61. *L. quernea*, (Dicks.) *yellowish* or pale-fusco-flavescent, *minutely granuloso-pulverulent*, effuse, thin, (K yellow C orange-red); *apothecia fuscous or fusco-rubescent*, moderate, scattered, *sub-immersed, plano-convex, immarginate, concolorous within;* hypothecium pale-yellow; paraphyses slender, fulvescent, apices reddish-brown; spores 8, colourless, ellipsoid, simple; gelatina hymenea cærulescent with iodine.

On aged oaks and sycamore, not unfrequent. 1785.

SYN:—Dicks. Br. Crypt. 19. (1785.) Ach. Syn. 36. Nyl. Scand. 196. Mudd Man. 192.

FIG:—E. Bot. 485. Dicks. Br. Cr. t. 2. f. 3. Mudd Man. t. 3. fig. 75.

EXS:—Hepp 494. Schær. 582. Nyl. 134. Welw. Lusit. 53. Anzi Etr. 49. Leight. 61. Larbal. 37. Mass. 311. Bohl. 84.

GEOG. DISTRIB:—France, Portugal, Italy, Sweden, Denmark.

BOT. PROV:—1, 2, 3, 4, 5...9, 10, 11...19...31.

ENGLAND:—Norfolk. *Mr. Dickson.* (1785.) Easby Wood! Guisbro' Wood! Cleveland. *Mr. Mudd.* between Thirsk and Woodend! Yorkshire. *Mr. Baker.* Middleton! near Oswestry, Shropshire; Wood opposite the Lodge, Herefordshire! *Rev. T. Salwey.* Newcastle, Northumberland. Newton Cap Wood near Bishop Auckland, Durham. *Mr. Winch.* Haldon and Stoke Wood, Devon. *Mr. Parfitt.* near Worcester; near Malvern; Fairlight near Hastings; Kings Kerswell, S. Devon. *Dr. Holl.* Kelvedon! Easthorpe, Essex. *Mr. Varenne.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Rosall near Exhall. *Mr. Purton.* Bedfordshire. *Rev. C. Abbot.* Cambridgeshire. *Rev. R. Relhan.* New Forest, very abundant. *Rev. J. M. Crombie.* Guestling, Sussex. *Rev. E. N. Bloomfield.* near Cirencester. *Mr. W. Joshua.* Edenbridge, Wrotham, Wye, Bogey, Seven Oaks. Kent. *Mr. Holmes.* (on sycamore) Parkgate! Cheshire, Nesscliffe Hill! Haughmond Hill! Bayston Hill! Sutton! near Shrewsbury, Wrekin! Llanyblodwel rocks!

IRELAND:—Butler's town river! Castlebernard. Bandon, and in Lord Kinmare's Deer Park, Killarney. *Mr. Carroll.*

CHANNEL ISLANDS:—Rozel; St, John's; Jersey! *Mr. Larbalestier.* Guernsey. *Rev. T. Salwey.*

"Spores .0025 in. long, by .00125—.0015 in. broad." *(Mudd).* "Spores 0.007—11 mm. long, 0.005—7 mm. broad. Gel. hym. and especially the asci I blue, then vinoso-fulvescent." *(T. M. Fr.)* "Spores 0.008—0.012 mm. long, 0.005 mm. broad." *(Nyl.)* Spores .01 mm. long, .0055 mm. broad.

62. *L. viridescens*, (Schrad.) *pallido-virescent*, thin, diffuse, *minutely granuloso-pulverulent*, (K yellow C crimson red); *apothecia fuscous-black*, moderate, scattered, or confluent, sessile or sub-immersed, *more or less convex, margined when young, subsequently sub-immarginate, obscure* or *palish-brown within; hypothecium pale-brown;* spores 8, colourless, ellipsoid, simple; *paraphyses indistinct;* gelatina hymenea cærulescent with iodine.

On old stumps and pales, not common.

SYN:—Schrad. Spicil. 88. (1794.) Ach. Syn. 36. Nyl. Scand. 206.

FIG:—Hepp Sporen t. 84. f. 731.

EXS:—Hepp 731. Anzi Langob. 176.

GEOG. DISTRIB:—Germany, Hungary, Lombardy, Sweden.

BOT. PROV:—1, 2.. 5.

ENGLAND:—New Forest; and near Exeter. *Rev. J. M. Crombie.* Midland Counties. *Mr. Purton.* near Shrewsbury!

Spores .011 mm. long, .004 mm. broad.

63. *L. sanguinaria*, (L.) *whitish* or *cinerascent*, moderate or thickish, sub-tartareous, *granuloso-unequal* or *granuloso-concrescent*, *(K yellow C—); apothecia black, convex, immarginate*, greyish

within, *medulla of thallus underneath vermillion-red;* hypothecium thin, pale-yellowish; *spores* 1, colourless, ellipsoid, simple, very large, minutely granulose, epispore broad; paraphyses indistinct, apices thick, bluish-black; asci and epispore blue with iodine.

On trees and rocks, frequent.

SYN:—Linn. Sp. Plant. No. 4. (1753.) Ach. Syn. 19. Nyl. Scand. 246. Mudd Man. 213.

FIG:—E. Bot. 155. Hffm. Pl. L. t. 41. f. 1. Hepp Sporen t. 56. f. 483.

EXS:—Fellm. 204. Hepp 483. M. & N. 842. Schær. 231. Mudd 184. Anzi It. S. 263. Leight. 307. Crombie 94. Reich. & Schub. 52.

GEOG. DISTRIB:—Scandinavia, E. Lapland, Sweden, Switzerland, Pyrenees, Italy.

BOT. PROV:—2...5...7, 8...10, 11, 12...14, 15...19...23.

ENGLAND:—Cromford Moor near Matlock. *Sir J. E. Smith.* Carlton Bank; Baysdale; Kildale, Ingleby Park! Yorkshire. *Mr. Mudd.* Hay Park! Herefordshire. *Rev. T. Salwey.* Sussex. *Mr. Borrer.* Cumberland! *Mrs. Stanger.* Brimham Rocks near Ripon. *Mr. Brunton.* Teesdale, Durham. *Rev. J. Harriman.* Hedgehope and Cheviot, Northumberland. *Mr. Winch.* Murton Crags, Northumberland. *Dr. G. Johnston.* Black Edge near Buxton. *Dr. Holl.* Craigforda! Shropshire.

SCOTLAND:—Craig Vinean! Craig-y-Barns! Dunkeld! *Dr. Lindsay.* Balmuto, Pentland Hills. *Dr. Greville.* Killin; Crianlarich. *Dr. Holl.*

IRELAND:—Lough Bay near Dublin. *Mr. Templeton.* Turk Mountain, Killarney. *Mr. Carroll.*

WALES:—Cader Idris. *Dr. Holl.* Llyn Bodlyn. *Mr. Holmes.* Barmouth! Cwm Bochlwyd!

"Spores .015—.018 in. long, .007—.008 in. broad. Spermogonia very minute, black, punctiform, immersed. Spermatia cylindrical, straight." (*Mudd.*) "Spores 0.070—100 mm. long, 0.028—40 mm. broad. Spermatia shortly acicular, straight, 0.008—10 mm. long." (*T. M. Fr.*) "Spores 0.070—0.0100 mm. long, 0.028—38 mm. broad." (*Nyl.*) Spores .021—.0235 mm. long, .01—.011 mm broad. Epispore .002 mm. broad. Spermatia .006 mm. long, .001 mm. broad. There is frequently an uniform sanguineous stratum below the gonidia in the thallus, which state is f. *plethorica*, Norm. Spec. loc. nat. 117, *polyerythrina*, Nyl. in hb. Fenn.

Var. *affinis*, (Schær.) differs from the type chiefly in the absence of the sanguineous stratum and in having only one large colourless spore.

On mosses, in alpine localities, rare.

SYN:—Schær. Enum. 132. Nyl. Scand. 246.

EXS:—Schær. 629. Zw. 336 A.

GEOG. DISTRIB:—Scandinavia.

BOT. PROV:—15.

SCOTLAND:—Morrone, Braemar. *Rev. J. M. Crombie.*

Spores .06 mm. long, .038 mm. broad. Epispore .003 mm.

Var. *melina* (Krphb.) differs from the type in the absence of the sanguineous stratum, but has two colourless spores.

On bark, rare. 1871.

SYN:—Kremplb. in Nyl. Nov. Gran. 2. p. 72. (1864.) Nyl. Lapp. Or. 166. *L. didymospora*, Stirton in Trans. Glasg. Nat. and in Grevillea 2. 60. T. M. Fr. Lich. Scand. 480.

GEOG. DISTRIB:—Nova Granada, Scandinavia.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Dr. Stirton.* (1871.)

"Spores 0.057—77 mm. long, 0.034—48 mm. broad. Spores 0.052—64 mm. long, 0.034—44 mm. broad." (*Nyl.*) Spores 0.051—68 mm. long, 0.028—44 mm. broad. (*T. M. Fr.*)

64. *L. enteroleuca*, Ach. *albido-virescent, crustaceous, granulose, areolato-rimulose, sub-furfuraceous*, or evanescent, (*K yellow C*—);

*apothecia black*, numerous, crowded, small, sessile, plane or plano-convex, margin thin, smooth, paler, eventually obliterated; *hypothecium colourless;* spores 8, colourless, broadly-oblong, simple, with 2 nuclei.

On rocks and stone walls, frequent.

SYN :—Ach. L. U. 177. (1810.) Syn. 19. Nyl. Scand. 217. Mudd Man. 201.
FIG :—Hepp Sporen t. 3. f. 6.
EXS :—Leight. 330. Zw. 13. 14. Schær. 531. Mudd 172. Hepp 6. 129. Anzi Venet. 76. Nyl. 57.
GEOG. DISTRIB :—Switzerland, Germany, Italy, France, Pyrenees, Sweden.
BOT. PROV :—1, 2, 3...5...7...10...26...31.
ENGLAND:—Near Battersby! *Mr. Mudd.* Llanforda! near Oswestry; Penzance! *Rev. T. Salwey.* Devon. *Mr. Parfitt.* Kelvedon; Copford, Essex. *Mr. Varenne.* St. Leonard's Forest, Sussex. *Mr. W. Joshua.* Tong Priory Walls! Leebotwood! Haughmond Hill! Brown Clee Hill! Llanforda! Grinshill! Shropshire.
IRELAND :—Loughcooter, Galway. *Mr. Carroll.*
WALES :—Aberdovey! *Rev. A. Bloxam.* Barmouth! Holyhead! Moel-y-gest!
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores 0.010—15 long, 0.006—9 mm. broad." (*Nyl.*) Spores .0135—.015 mm. long, .0085—.01 mm. broad. Paraphyses distinct, apices fuscous or blackish, I blue. Excipulum externally laterally slightly nigricant.

65. *L. minuta*, (Schær.) *greenish-whitish or cream-coloured, very thin*, granulate, indeterminate or obsolete, (K—C—); *apothecia minute*, numerous, scattered, adnate, plane, *pallido-testaceous, reddish or nearly black when old*, and then convex and immarginate; *hypothecium pale; paraphyses indistinct, apices colourless; spores* 8, colourless, elliptical or oblong, simple, minute; gelatina hymenea I vinous-red.

On trees, not common. 1854.

SYN :—Schær. Spicil. 170. (1833.) Enum. 139. Mudd Man. 195. Nyl. Lapp. Or. 145. *Biatora sylvana*, Körb. S. L. G. 200.
FIG :—Hepp Sporen t. 4. f. 17. f. and t. 56. 487.
EXS :—Hepp 17. 487. 733. Arn. 47. 416. Mudd 163. Leight. 298.
GEOG. DISTRIB :—Switzerland, Sweden, Norway, Bavaria, Hungary.
BOT. PROV :—2, 3...5...10...15.
ENGLAND :—Airyholme Wood!; Hoggarts Wood, Ingleby, Cleveland. *Mr. Mudd.* (1854.) New Forest; Isle of Wight. *Rev. J. M. Crombie.* near Malvern. *Dr. Holl.* Braxted, Essex. *Mr. Varenne.*
SCOTLAND :—(f. *saxicola*) Kincardine. *Rev. J. M. Crombie.*
"Spores .0025—.003 in. long, .00075 in. broad." (*Mudd*). "Spores 0.009—15 mm. long, 0.003—4 mm. broad." (*T. M. Fr.*) "Spores 0.007—0.011 mm. long, 0.003—4 mm. broad." (*Nyl.*) Spores .011—.0135 mm. long, .004—5 mm. broad.

Var. *sarcopsioides*, (Mass.) dirty-white or sub-virescent, granulose, effuse; *apothecia dark-violet, globulose, cæsio-pruinose.*

On old posts, &c., rare.

SYN :—Mass. Ric. 128. (1852.) Arn. in Flora 1863. p. 330. Crombie En. 69.
FIG :—Mass. Ric. fig. 252.
EXS :—Anzi Venet. 61. 62.
GEOG. DISTRIB :—Italy.
BOT. PROV :—2...10.
ENGLAND :—Shanklin; Lyndhurst; *Rev. J. M. Crombie.* Cleveland. *Mr. Mudd.*
"Spores .0061 mm. long, .00122 mm. broad." (*Mass.*) Spores .008—.01 mm. long, .003—.0035 mm. broad.

66. *L. tenebricosa*, (Ach.) *greenish-white* or *cream-coloured, very thin*, granulate, indeterminate or obsolete, (K—C—); *apothecia fuscous or rufo-fuscous, minute*, scattered, plane, margined;

*hypothecium pale; paraphyses distinct, thickish, apices incrassate, fuscous*; spores 8, colourless, elliptical or oblong, simple, minute; *gelatina hymenea I blue.*

On trees, not common.

SYN:—Ach. L. U. 382. Nyl. Scand. 201. Lapp. Or. 145.
EXS:—Leight. 326. Anzi Ven. 27.
GEOG. DISTRIB:—Scandinavia, E. Lapland.
BOT. PROV:—10.
ENGLAND:—Cleveland! Yorkshire. *Mr. Mudd.*
"Spores 0.010—18 mm. long, 0.004—5 mm. broad—or spores 0.008—0.015 mm. long, 0.0040—0.0045 mm. broad." (*Nyl.*)

67. *L. aphana*, Nyl. *grey*, thin, *sub-verrucoso* or *subgranuloso-unequal*, indeterminate; *apothecia black*, rather small, slightly convex, immarginate, *albicant within; hypothecium colourless* or *sometimes slightly violaceo-fuscescent in the lower portion; epithecium violaceo-fuscescent;* spores 8, colourless, ellipsoid or oblong, simple, minute; *thalamium vaguely violaceo-fuscescent;* gelatina hymenea cærulescent with iodine.

On maritime rocks, rare. 1865.

SYN:—Nyl. in Flora 1867. p. 327. Crombie En. 84.
GEOG. DISTRIB:—Europe.
BOT. PROV:—24.
IRELAND:—Near Kilkee! co. Clare. *Mr. Carroll.* (1865.)
Externally comparable with *L. sylvicola*, but quite distinct. "Spores 0.008—0.011 mm. long, 0.0035—0.0045 mm. broad." (*Nyl.*)

68. *L. aphanoides*, Nyl. *darkly-olivaceo-cinerascent*, thin, *sub-verrucoso* or *sub-granuloso-unequal*, indeterminate or sub-evanescent; *apothecia black, smallish*, slightly convex, immarginate, naked, whitish within; *hypothecium colourless* or *slightly-rubricoso-rufescent in lower portion; epithecium cærulescent;* spores 8, colourless, ellipsoid, simple; *thalamium cærulescent;* paraphyses indistinct; gelatina hymenea cærulescent, then violaceo-rubescent with iodine.

On calcareous mountain rocks, rare. 1868.

SYN:—Nyl. in Flora (1868.) p. 476. Crombie En. 84.
GEOG. DISTRIB:—Europe.
BOT. PROV:—15.
SCOTLAND:—Craig Guie, ! Braemar. *Rev. J. M. Crombie.* (1868.)
Approaching *L. aphana*, Nyl. but with a differently colored thalamium and smaller spores, &c. "Spores 0.009–0.013 mm. long, 0.045—0.0055 mm. broad." (*Nyl.*)

69. *L. misella*, Nyl. *luteo-virescent*, thin, effuse, *minutely unequally granulose, almost furfuraceous*; *apothecia livido-fuscous, fuscous or nigro-fuscous, somewhat greenish when wet, minute*, scattered or numerous, subinnato-sessile, convex, immarginate; *hypothecium colourless;* hymenium pallido-nigrescent, or pale-violet, like pale ink; *spores* 8, colourless, *minute*, oblongo-ellipsoid, simple; paraphyses indistinct, epithecium colourless; I pale-blue then slightly-vinous.

On putrid fir pales, rare. 1870.

SYN:—Nyl. Scand. p. 202 (1861.) Nyl. Lapp. Or. p. 177 (1866.) Crombie in Journ. Bot. n. s. 2. p. 134. *L. melanochroza*, Leight. Lich. Fl. 2d. ed. p. 267. Crombie in Seem. Journ. 11. 178. (1871.)
GEOG. DISTRIB:—Finland.
BOT. PROV:—15.

SCOTLAND :—Near Loch Tummel, Perthshire! *Rev. J. M. Crombie.* (1870.)
"Spores 0.007—9 mm. long, 0.0030—0.0035 broad." (*Nyl.*) Spores .01—.012 mm. long, .004—.0045 broad.

70. *L. confusula*, Nyl. *olive-grey or bright-brownish-grey*, thinnish, *granulate, or granulato-conglomerate, glomerules dispersed; apothecia black, adnate*, convex, immarginate, white within; epithecium yellowish-brown; *hypothecium colourless;* spores 8, colourless, ellipsoid, simple, somewhat small; paraphyses slender, indistinct, but distinct with K.

On micaceous old stone walls. 1871.

SYN :—Nylander in Flora 1872. p. 360.
BOT. PROV :—15.
SCOTLAND :—Craig Tulloch. Blair Athole. *Rev. J. M. Crombie.* (1871.)
"Spores 0.007—11 mm. long, 0.0040—45 mm. broad." (*Nyl.*)

71. *L. sporadiza*, Strn. *yellow or greenish-yellow, granulose, or granuloso-verrucose*, granules often *conglomerate and pulverulent*, (K yellow C orange-red); *apothecia black, sessile*, small or moderate, plane, rugose, *margined, internally cinerascent;* hypothecium colourless; spores 8, colourless, ellipsoid, simple; paraphyses indistinct, few; gelatina hymenea I untinged.

On old wood. 1874.

SYN :—Stirton in Grevillea 3. p. 33. (1874.)
BOT. PROV :—15.
SCOTLAND :—Near Grantown, Inverness. *Dr. Stirton.* (1874.)
Allied to L. *neglecta.* (*Nyl.*) "Spores .006—7 mm. long, .004—45 mm. broad." (*Strn.*)

72. *L. epimarta*, Nyl. *whitish, minutely-depresso-granulate, scattered*, (K yellow); *apothecia fuscous, subobconical*, somewhat plane on upper part, immarginate, *generally suffused with a ferruginous-ochraceous colour*, internally dusky-pale-ochrey; spores 8, colourless, oblong, minute; *thalamium somewhat ochrey;* paraphyses slender, few; *hypothecium thick, solid, nearly colourless or dilutely-ochraceous.*

On the earth in alpine mountains. (1876.)

SYN :—Nyl. in Flora 1877. p. 226.
SCOTLAND :—Appin. *Rev. J. M. Crombie.*
"A small but singular species approaching *Lecidea uliginosa.* Spores .006—9 mm. long, .0025—.0035 mm. broad. Thecæ clavate, thick and solid in the upper part. Gelatina hymenea I blue then luteo-fulvescent, especially the thecæ. Apothecia somewhat crowded, prominent, tuberculiform, or plane above, narrow below, their lamina thin, somewhat ochraceous, but ochraceo-fuscescent in the upper portion. The epithecial granulations on the addition of K are changed into raphides, a peculiar characteristic of this species." (*Nyl.*)

73. *L. callicarpa*, Larbal. *pale-albido-sulphureous, pulverulento-granulate*, effuse, *(K—C—reddish); apothecia pallido-carneous*, minute, *clustered* or scattered, *convex, somewhat pruinose, immarginate, (K—C reddish);* hypothecium colourless; paraphyses cohærent, apices colourless; spores not seen.

On damp perpendicular rocks, very rare. 1877.

BOT. PROV :—26.
IRELAND :—Glencorbot near Kylemore, Galway. *Mr. Larbalestier.* (1877.)

74. *L. rufofusca*, Anzi. *albo-lutescent or albo-fuscescent*, thickish, *crowded into a verruculoso-granulose crust; hypothallus white; apothecia rufo-fuscous or atro-purpureous*, plane, sessile, *with an*

*elevated concolorous margin*, at length convex and immarginate; *hymenium fuscous upwards;* paraphyses conglutinate; *hypothecium yellowish;* spores 8, colourless, ellipsoideo-oblong, simple.

On trees, rare. 1877.

SYN :—Anzi Catal. Sondr. p. 76. (1860.)
GEOG. DISTRIB :—Italy.
BOT. PROV :—26.
IRELAND :—Twelve Pins, Kylemore, Galway. *Mr. Larbalestier.* (1877.)

†† *Hypothecium dark.*

75. *L. sanguineo-atra*, (Ach. pr. p.) *cinerascent* or virescenti-cinerascent, *granulose*, thin or sub-continuous or obsolete; *apothecia sanguineous-black*, or fuscous-black or fusco-rufescent, moderate, *convex*, *immarginate*, *fusco-nigricant within*; hymenium paler or pallescent; *hypothecium thick*, *fuscous;* spores 8, colourless, ellipsoid or oblong, simple.

On mosses, trees and earth, in sub-alpine localities, not frequent.

SYN :—Ach. Meth. 50. (1803.) Nyl. Prodr. 106. Scand. 199. Mudd Man. 198.
EXS :—Nyl. 52. Arn. 229. Anzi Langob. 181.
GEOG. DISTRIB :—Scandinavia, Sweden, France, Pyrenees, Switzerland, Bavaria, Lombardy, Algeria, Arctic America, Great Bear Lake.
BOT. PROV :—5...7...10...15...19...30.
ENGLAND :—Broughton Bank and Hoggarts Wood, Ingleby, Cleveland. *Mr. Mudd.* Downton Castle Woods. Shropshire!
SCOTLAND :—Ben Lawers! *Rev. Churchill Babington.* Glen Falloch. *Dr. Holl.*
IRELAND :—Deer Park, Belfast. *Dr. Dickie.* near Bantry. *Miss Hutchins.*
WALES :—Cader Idris. *Dr. Holl.* Drwsynant!

"Gelatina hymenea I blue then vinous-red or violet. Spores 0.010—19 long, 0.005—8 mm. broad." (*Nyl.*) "Gelatina hymenea I commonly distinctly and intensely red, but sometimes at first blue then dark-violet. Spores 0.010 -31 mm. long, and 0.004—6 mm. broad." (*T. M. Fries.*) "Spores .0025 to .003 in. long by .001 in. broad." (*Mudd.*) T. M. Fries (Lich. Scand. .436) says this lichen and its varieties are notably distinguished by cærulescent or violet granules amongst the paraphyses, not found in any other lichen not even in its allies, *L. Berengaria* and *L. albofuscescens*, but these do not occur in the specimens above cited. Can our British plant then be referable to *L. albofuscescens* since the thallus is thickish granulose and with K gives a pale dirty yellow?

76. *L. valentior*, Nyl. *cinereous or subvirescent*, thin, *continuous*, *rimose*; *apothecia fuscous*, *immarginate*, somewhat plane or convex, *often obtusely submarginate*, *and margin pallescent*; hypothecium dark-fuscous; hymenium pale-fuscescent; paraphyses distinct, apices colourless; spores 8, colourless, ellipsoid, simple, large.

On decomposed rocks, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 229.
BOT. PROV :—26.
IRELAND :—Lough Inagh! Galway. *Mr. Larbalestier.* (1876.)

"Probably a subspecies of *L. sanguineo-atra*, from which it scarcely differs except in the constantly larger spores .012—17 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .0155 mm. long, .0065 mm. broad.

77. *L. fusca*, (Schær.) *viridulo-cinerascent*, *disperso-granulate*, thin, evanescent; *apothecia fuscescent* or *nigricant*, opake, *adnate*, at first plane with a thin elevated margin, then convex and immarginate; *hypothecium luteo-fuscescent*; spores 8, colourless, oblong or fusiformi-oblong, simple; paraphyses distinct, filiform.

On dead mosses, in mountainous regions, rare.

SYN :—Schær. Enum. 140. (1850.) Fr. Arct. 195. Nyl. Lapp. Or. 143.
GEOG. DISTRIB :—France, Switzerland, E. Lapland, Sweden.
BOT. PROV :—7...15.
SCOTLAND :—Ben Lawers! *Adm. Jones and Mr. Carroll.*
WALES :—Near Dolgelley!
"Gelatina hymenea I blue then vinous-red. Spores 0.010—14 mm. long, 0.0045—0.0055 broad." *(Nyl.)* "0.010—15 mm. long, 0.004 mm. broad." (*T. M. Fries.*) Dark-coloured granules irregular in form are intermixed with the paraphyses, in all the specimens in my herbarium cited as above. Spores .014—.016 mm. long, .005 mm. broad.

78. *L. mœstula*, Nyl. *darkly-cinerascent*, thin, *depresso-subgranulate* or evanescent (K—C—) ; *apothecia black, minute, crowded*, plane or convex, immarginate, *colourless within* ; spores 8, colourless, ellipsoid, simple ; paraphyses indistinct ; *epithecium colourless* ; *hypothecium entirely fusco-obscurate* ; *gelatina hymenea slightly-blue then vinous-red* with iodine.

On palings &c. rare. 1868.

SYN :—Nyl. in Flora 1868. p. 344. Crombie En. 69.
EXS :—Crombie 85.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2.
ENGLAND :—Near Lyndhurst in New Forest! *Rev. J. M. Crombie.* (1868.)
Approaching *L. myriocorpoides*, Nyl. ; *L. dispansa*, Nyl. ; and *L. turgidula*, Fr. "Spores 0.007—8 mm. long, 0.0025—0.0035 mm. broad. Spermatia oblong 0.0040—0.0045 mm. long, 0.0015 mm. broad. Sterigmata short." (*Nyl.*)

79. *L. submœstula*, Nyl. *cinerascent*, minutely *subverrucoso-granulose or subdispersed* ; *apothecia black, convex, immarginate*, often 2 or more connate, internally concolorous ; *hypothecium thick, nigro-fuscous ; paraphyses indistinct*, apices subsmaragdulo-nigrescent ; spores 8, colourless, ellipsoid, simple, gelatina hymenea I blue then vinoso-fulvescent.

On dry sand-rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 235.
BOT. PROV :—26.
IRELAND :—Road to Westport five miles from Kylemore! *Mr. Larbalestier.* (1876.)
"Spores .006—.010 mm. long, .0035 mm. broad." (*Nyl.*) Spores .011 mm. long. .0045 mm. broad.

80. *L. parasema*, (Ach.) *whitish* or *cinerous* or *greenish-yellow*, sub-determinate, often nigro-limitate, thin, *smooth* or *granulose* or *verrucoso-granulose*, (*K yellow C orange-reddish*) ; *apothecia black*, small, plane or sub-convex, margin thin, smooth, at length obliterated ; *hypothecium fuscescent*, lateral excipulum pale or bluish ; spores 8, colourless, ellipsoid, simple, with one or two nuclei.

On various trees, old palings, occasionally on rocks and walls, frequent.

SYN :—Ach. L. U. 275. in part (1810.) Nyl. Scand. 216.
FIG :—E. Bot. 1450. in part.
GEOG. DISTRIB :—Europe, Sweden, France, Switzerland, Hungary, Italy, Germany, Pyrenees, Portugal.
ENGLAND :—Common.
SCOTLAND :—Common. *Rev. J. M. Crombie.*
IRELAND :—Common. *Mr. Carroll.*
WALES :—Common.

CHANNEL ISLANDS :— Common on all the Islands, *Mr. Larbalestier.*

This species, growing on trees, varies greatly in the characters of its thallus, being continuous and smooth (Smrft. 48. Leight. 328. Anzi It. Sup. 279. Hepp 127.) Sussex ! *Mr. Borrer.* Shropshire ! Barmouth ! ; minutely granulate (Mudd 169. Nyl. Pyr. Or. 43) near Ayton ! *Mr. Mudd.* Sussex ! *Mr. Borrer ;* minutely horizontally corrugate (Anzi It. Sup. 276. b. 277c. Leight. 327) Ulting and Hatfield ! *Mr. Piggott.* Barmouth ! ; continuous, but breaking up into detaching flakes (Hepp 3. Zw. 350. Anzi Langob. 187. Ital. Sup. 275. 278.) Fermoy ! Castlebernard ! Cork ! *Mr. Carroll.* Sharpstones ! ; Shelton ! Weir Coppice ! Haughmond Hill ! Shropshire ! convexo-areolate, subfurfuraceous, (Hepp 725. Smrft. 46. 47. 129. Anzi Venet. 75. Ital. Sup. 281) Glen Nevis ! *Dr. Lindsay.* Sharpstones ! Montford Bridge ! Shropshire ; Leprose. (Reich. and Schub. 53. Anzi Etr. 30.) Cork ! *Mr. Carroll.* Alberbury ! Abdon ! Sutton Spa ! Shropshire.

The characteristics in all forms are the chemical reactions (K yellow C orange-reddish) ; the fuscescent hypothecium with a pale or bluish lateral excipulum ; and the nucleolate spores.

Var. *tabescens*, (Körb.) cinereo-virescent or yellowish-green, thin, effuse, somewhat shining, subrimulose (K yellow C orange-red) ; *apothecia livido-fuscous, adnate* or *subinnate, tumid* and convex, difformed, margin obscure, soon obliterated.

On beech. not common. 1856.

SYN :—Korb. Syst. 203. (1855.)
FIG :—Hepp Sporen t. 61. f. 525.
EXS :—Hepp 525. Leight. 329.
GEOG. DISTRIB :—Switzerland, Germany.
BOT. PROV :—7.
WALES :—Barmouth ! (1856.)

Var. *flavens*, Nyl. simular to the type, but with a *yellowish* thallus and apothecia internally whitish, and *hypothecium nearly colourless*, (K yellow C orange-red).

On trees, rare. 1869.

"Latet sub *elæochroma*, Ach. (ex. hb. Ach.) a quâ etiam parum diversa." (*Nyl.*)
SYN :—Nyl. Scand. 217. (1861.) Crombie En. 77.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—5...7...15.
ENGLAND :—Brampton Brian Park ! Stannor Hill ! Herefordshire. Sharpstones ! Shropshire.
SCOTLAND :—On spruce fir near Abergeldie Castle ! Braemar and in Breadalbane. *Rev. J. M. Crombie.*
WALES :—Dolgelley !

Var. *elæochroma*, Ach. *greenish-yellow* or *yellow* or *dirty* and *dark-greyish-green*, effuse or nigro-limitate, *granulose* or *granuloso-furfuraceous and cracked*, (K yellow C orange-reddish) ; apothecia black, small, numerous, plane or convex, margin thin, afterwards obliterated.

On trees, frequent.

SYN :—Ach. L. U. 275. (1810.) Syn. 18. Nyl. Scand. 217.
FIG :—E. Bot. 1450. in part.
EXS :—Leight. 126. Mudd 170. Nyl. 140. Zw. 128. Bohl. 45. Maudon 4. M. & N. 746. Anzi It. Sup. 274. Arn. 230 Hepp 128.
GEOG. DISTRIB :—France, Switzerland, Italy, Hungary, Germany.
BOT. PROV :—1, 2, 3...5...7, 8...10...15, 16...19, 20...31.
ENGLAND :—Ayton. *Mr. Mudd.* Oswestry ! *Rev. T. Salwey.* Sussex. *Mr. Borrer.* Twycross ! Leicestershire. *Rev. A. Bloxam.* near Worcester ! *Mr. Lees.* Tetsworth ! Oxfordshire. *Mr. Larbalestier.* Devon. *Mr. Parfitt.* Lyston ; Witham ! Feering ; Baddow, Essex. *Mr. Varenne.* Red Hill ! Alberbury ! Shelton ! Sharpstones Hill ! Llanymynech ! Shropshire.
SCOTLAND :—Glen Nevis ! *Dr. Lindsay.* Long Island. *Prof. Balfour.*

IRELAND :—Fermoy! *Mr. Chandler.* Castlebernard! Bandon; Blarney! Glanmire! Cork! *Mr. Carroll.*
WALES :—Woods! common. Llanbedrog! Capel Curig! Barmouth!
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

Var. *ecrustacea*, thallus nearly or quite *evanescent.*

On old palings, probably frequent. 1858.

EXS :—Leight. 308.
GEOG. DISTRIB :—Hungary, Italy.
BOT. PROV :—5...7.
ENGLAND :—Caer Caradoc! Shropshire.
WALES :—Aberdovey!

Var. *latypea*, Ach. whitish or sub-cinereous or almost evanescent, effuse, unequal, *granulato-arreolate*, (K yellow C orange-red); apothecia black, sessile.

On rocks, not common.

SYN :—Ach. Meth. Suppl. 10. (1803.) Syn. 14. Nyl. Scand. 217.
GEOG. DISTRIB :—Norway, Sweden.
BOT. PROV :—15...19...26...30.
SCOTLAND :—Ben. Lawers. *Adm. Jones.* Coast of Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Brandon Mountain. *Mr. Carroll.* co. Down. *Adm. Jones.* Letterfrack. *Mr. Larbalestier.*

Var. *monticola*, (Ach.) similar to the type, but with *evanescent* thallus, apothecia and spores smaller.

On stones, rare. 1864.

SYN :—Ach. L. U. 670. (1810.) *L. parasema var. nitidula*, Nyl. Scand. 217.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Ben. Lawers. *Messrs. Carroll* (1864.) *and Holl.*

forma *latypiza*, Nyl. *subcinereous, effuse, granulose*; apothecia *black*, sessile.

On rocks, rare. 1876.

SYN :—Nyl. Pyr. or. p. 201.
BOT. PROV :—26.
IRELAND :—Kylemore. co. Galway. *Mr. Larbalestier.* (1876.)

81. *L. protrusa*, Fr. *pale-sulphur-colour*, effuse, *thickish*, crustaceous, *verrucoso-granulose*, rugulose, *areolato-rimose*, (K yellow C orange-red); *apothecia black*, numerous, moderate, *congregated, confluent, innato-sessile*, plane, at length convex, margin thin, smooth, entire, often flexuose, eventually obliterated; *hypothecium rufo-fuscous*; spores 8, colourless, elliptico-oblong, simple.

On alpine and subalpine rocks, frequent.

SYN :—Fries L. Ref. 324. (1831.) Mudd Man. 207. *L. scabra*, Tayl! Fl. Hib. 2. 121. *L. glomerulosa, Nyl.*
FIG :—Mass. Ric. fig. 150.
EXS :—Schær. 578. Zw. 12.
GEOG. DISTRIB :—Switzerland, Germany, Italy, France.
BOT. PROV :—1...6, 7...15, 16...26...31.
ENGLAND :—Near Torquay! Devon. *Dr. Deakin.* Lanorma Cave! Cornwall. *Mr. Borrer.*
SCOTLAND :—Isle of Skye! *Mr. Borrer.*
IRELAND :—Glengariff! *Mr. Carroll.* Dawros river! near Rynvyle, Connemara! Glencorbot! *Mr. Larbalestier.*
WALES :—Barmouth and Dolgelley. *Mr. Holmes.* South Stacks! Holyhead. Trefriw! Manorbeer! near Tenby. Gimlet Rock! Pwllheli. Maenorowen! near Fishguard, Pembrokeshire.

CHANNEL ISLANDS :—Fort Essex ! Alderney. *Mr. Larbalestier.*
"Spores .0025—.003 in. long, by .00125 to .0015 in. broad." *(Mudd).* Spores .0115—.014 mm. long, .007—.008 mm. broad.

82. *L. viridans*, Fw. *pale-sulphur-colour*, effuse, *thin*, *minutely granulose*, (K yellow C orange-red) ; *apothecia black*, moderate, *innato-sessile*, more or less *duskily-virido-pruinose*, plane, at length convex, margin thin, smooth, entire ; *hypothecium pale-fuscescent ;* spores 8, colourless, elliptico-oblong, simple.

On subalpine rocks, frequent. 1875.

SYN :—Flotow in Flora 1828. p. 697. Krbr. S. L. G. 242. Par. 213.
FIG :—Hepp Sporen t. 84. f. 726.
EXS :—Zw. 203. Hepp 726. and 133. left hand specimen. Anzi Langob. 155. Leight. 331.
GEOG. DISTRIB :—Germany, Italy.
BOT. PROV :—5...7.
ENGLAND ;—Lyth Hill ! Shropshire.
WALES :—Y Fegle Fawr near Barmouth ! (1875.)
The apothecia, when moistened, appear paler and transparent, owing to the pale hypothecium, surrounded by a dark ring, "*humectatis disco hyalino.*" Flot. l. c. Spores 1½—2 longer than broad.

forma *nigrita*, Leight. similar to the type, but dark and *nigricant*, from the predominating black hypothallus.

On subalpine rocks, frequent. 1856.

BOT. PROV :—5.
ENGLAND :—Cowcombe ! Gloucestershire. *Mr. Joshua.* Haughmond Hill ! Shropshire (1856.)

83. *L. enterochlora*, Tayl. *pale-sulphur-colour*, effuse, *thin*, *closely appressed*, *smooth*, *rimulose*, *eventually breaking up into a sorediate state*, (K yellow C orange-red) ; *apothecia black*, moderate, *innato-sessile*, plane, at length convex, margin thin, smooth, entire, often flexuose, eventually obliterated ; *hypothecium rufo-fuscous ;* spores 8, colourless, elliptico-oblong, simple.

On subalpine and maritime rocks, frequent.

SYN :—Tayl ! in herb. Borrer. *L. subviridans*, Nyl.
EXS :—Leight. 299. Zw. 238.
GEOG. DISTRIB :—Sweden, Germany, Italy.
BOT. PROV :—1...5, 6, 7...10, 11...19, 20 ..26.
ENGLAND :—Cliffrig ! Cleveland. *Mr. Mudd.* Durham ! *Mr. Robertson.* Stony Valley, Torquay, Devon ! *Dr. Deakin.* Grinshill ! Shropshire.
IRELAND :—Derriquin ! *Dr. Taylor.* Cork ! *Mr. Carroll.* Ruins at Cleghan near Kylemore, Lettermore ! and Lough Teagh ! *Mr. Larbalestier.*
WALES : -Aberdovey ! *Rev. A. Bloxam.* Barmouth ! Y Fegle Fawr ! near Barmouth. between Fishguard and Llanachar ! Pembrokeshire.
This and the two preceding species may be possibly only states of one and the same lichen. Spores .013—.014 mm. long, .0075 mm. broad.

84. *L. sublatypea*, Leight. *whitish or albido-cinerascent*, tartareous, *sub-areolato-granulose*, or *unequally granulose*, more or less *dispersed*, (K—C) ; *apothecia nigro-fuscous*, numerous, scattered, *sessile*, *concave*, *margin* thickish, prominent, *elevated*, somewhat polished ; *hypothecium nigro-fuscous* ; *hymenium and epithecium dark-bluish-black* ; paraphyses crowded, indistinct ; spores 8, colourless, ellipsoid, simple, small.

On alpine rocks, rare. 1870.

EXS :—Crombie 88.
GEOG. DISTRIB :—Europe.

BOT. PROV :—15.
SCOTLAND :—Craig Tulloch ! and Glen Fender ! Blair Athole. *Rev. J. M. Crombie.*
Externally somewhat resembling some state of *L. parasema var. latypea*, (K yellow C orange-reddish) but differing in chemical reaction and other characters. Certainly not identical with *L. vorticosa*, (Flk.) as stated by T. M. Fries L. Scand. p. 515. if that species be correctly represented by Anzi Langob. 353 and Rabh. 771. Spores .011—.0125 mm. long, .0045—.005 mm. broad.

85. *L. rusticula*, Nyl. *albido-glaucescent*, granulate, *granules sub-conglomerate, depresso-convex, sub-crenate, smooth*, (K yellow, C yellow) ; *apothecia minute*, somewhat concave, *black, margin obtuse, entire*, eventually obliterated ; *hypothecium fuscous ;* spores 8, colourless, ellipsoid, simple ; paraphyses indistinct ; gelatina hymenea deep-blue, afterwards dirty-lutescent with iodine.

On quartzose rocks, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 371. Leight. Not. Lich. No. xv.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...26.
WALES :—Giant's Pebbles ! Cader Idris.
IRELAND :—Salrock Road ! Connemara. *Mr. Larbalestier.*
"Spores 0.010—15 mm. long, 0.005—8 mm. broad." (*Nyl.*) Spores .014. mm. long, .0065 mm. broad.

86. *L. furvella*, Nyl. *nigro-fuscous*, effuse, *obliterato-squamulose, granuloso-furfuraceous, diffracto-areolate*, (K—C red) ; *apothecia* small, scattered, *appressed;* plane, black, rugulose, *margin* thin, smooth, *flexuose ; epithecium nigricant ; hypothecium nigro-fuscous ;* paraphyses indistinct, conglutinate, spores 8, colourless, oblong or ovate, simple.

On micaceous-schistose alpine rocks, rare. 1861.

SYN :—Mudd Man. 207. (1861.) Crombie Enum. 84. Nyl. Flora 1866 p. 418.
GEOG. DISTRIB :—Sweden, Norway, Finland.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers ! *Adm. Jones.* near base of Ben Lawers ! *Mr. Carroll.* Glen Calleter ; foot of Ben-y-gloe ; Glen Fender ! Blair Athole. *Rev. J. M. Crombie.*
"Spores .009—011 mm. long, .0045 mm. broad." (*Nyl.*) "Spores .003 in. long, by .001—.00125 in. broad." (*Mudd*). The thallus has a good deal the appearance of that of *Pannaria nigra* and is composed of minute sphærical brown granules containing gonidia, on a thickish-brown hypothallus. Gel. hym. I lutescent. Spores .016 mm. long, .009 mm. broad.

87. *L. furvula*, Nyl. *nigro-fuscous, effuse, obliterato-squamulose, granuloso-furfuraceous, continuous*, (K—C red) ; *apothecia* scattered, *sessile, plane, black, margin* thin, *sub-flexuose ; epithecium cærulescent ; hypothecium black* ; paraphyses indistinct ; spores 8, colourless, oblong, simple.

On schistose alpine rocks, very rare. 1864.

SYN :—Nylander in Flora (1866.) p. 418. Crombie Enum. 84.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers ! *Messrs. Carroll* (1864.) *and Holl.*
"Spores 0.012—17 mm. long, 0.006—8 mm. broad." (*Nyl.*) Thallus similar in structure to the preceding. Are not this and the preceding states only of one and the same lichen ? Gel. hym. I lutescent. Spores .012—.014 mm. long, .006 mm. broad.

88. *L. alpestris* (Smmrf.) *cinerascent*, thin, *granulate* or granulato-sub-areolate or sub-evanescent, *hypothallus whitish*, (K faint yellow or — C —) ; *apothecia black, convex*, moderate, *immarginate*,

subconglomerate, concolorous within; epithecium and thalamium sordidly cærulescent; *hypothecium fuscescent*; spores 8, colourless, elongato-ellipsoid or oblong, simple; paraphyses scarcely distinct; gelatina hymenea cærulescent, then fulvescent with iodine.

On the earth in alpine places, rare. 1864.

SYN:—Sommerfelt Lapp. 155. (1826.) Nyl. Lapp. Or. 158. Crombie Enum. 79.
EXS:—Fellm. 164.
GEOG. DISTRIB:—E. Lapland, Norway, Sweden, Finland.
BOT. PROV:—15.
SCOTLAND:—Summit of Ben Lawers! *Mr. Carroll.* (1864.) Ben Macdhui; Braedalbane and Braemar. *Rev. J. M. Crombie.*
"Spores 0.011—16 mm. long, 0.004—5 mm. broad." (*Nyl.*) "Spores 0.014—25 mm. long, 0.003—4 mm. broad." (*T. M. Fries.*)

89. *L. cuprea*, Smrft. *white*, thick, *verrucoso-granulate*, diffract, granules sublobate, contiguous, (K— or slightly yellow C—); apothecia *rufo-ochraceous, or fusco-rufous, hemispherical, immarginate*, often botryoso-conglomerate; *hypothecium pale-luteo-fuscescent; paraphyses distinct*, fulvescent; *spores* 8, colourless, *elongato-oblong*, simple; gelatina hymenea I slightly cærulescent, then vinous-red.

On the earth in alpine regions, rare.

SYN:—Smmrf. Lapp. 165. (1826.) Nyl. Scand. 199. Lapp. Or. 144. T. M. Fr. Scand. 426.
EXS:—Fellm. 152.
GEOG. DISTRIB—Sweden, E. Lapland, Norway.
BOT. PROV:—15.
SCOTLAND:—Summit of Ben Lawers and above Loch-na-Cat. *Rev. J. M. Crombie.*
"Spores 0.009—0.016 mm. long, 0.004—5 mm. broad." (*Nyl.*) "Spores 0.010—22 mm. long, 0.003—6 mm. broad." (*T. M. Fries.*) Spores .016 mm. long, .005 mm. broad.

Var. *cupreiformis*, E. Nyl. thin, *egranulose*; apothecia rufo-fuscous.

On the earth in alpine regions, rare. 1868.

SYN:—*L. vernalis var. cupreiformis*, E. Nyl. Al. Lafv. p. 90. Nyl. Lapp. Or. 144. Crombie En. 68.
GEOG. DISTRIB:—E. Lapland.
BOT. PROV:—15.
SCOTLAND:—Loch-na-Cat. *Adm. Jones.* (1868.)

Var. *lecanodes* Nyl. apothecia spuria lecanoroidea, Ben Lawers (1871). *Dr. Stirton.*

Grenvillea 2.71.

90. *L. Berengeriana*, (Mass.) *white, squamuloso-granulate*, squamules lobulate, *concrescent into a continuous crust*, (K— or slightly yellow C—); apothecia thin *fusco-nigricant*, at first *plane with a thin obtuse margin*, then plano or *depresso-convex, and immarginate; hypothecium thick, fuscous; paraphyses conglutinate, indistinct; spores* 8, colourless, *oblong* or ellipsoideo-oblong, simple; gelatina hymenea I vinous-red.

On the earth in alpine regions, rare.

SYN:—*Biatora*, Mass. Ric. 128. (1852.) Nyl. Lapp. Or. 144. T. M. Fr. Scand. 433.
FIG:—Mass. Ric. fig. 254.
EXS:—Fellm. 162. Arn. 439.
GEOG. DISTRIB:—E. Lapland, Norway, Sweden, Finland.
BOT. PROV:—15.

SCOTLAND :—Ben. Lawers. *Mr. Carroll.*
"Spores 0.010—0.018 mm. long, 0.0045—0.0065 mm. broad." (*Nyl.*) "Spores 0.009—16 mm. long, 0.004—6 mm. broad." (*T. M. Fries.*) Spores .012—.015 mm. long, .005 mm. broad.

91. *L. arctica*, Smrf. *albido- or fuscescenti-cinerascent*, effuse, *granulose* or granuloso-verrucose, granules small, papilloso-subglobose, (K faint-yellow C orange-red); *apothecia* small, *black*, *slightly cæsio-pruinose*, *convex*, *immarginate*, within obscurely cinerascent; hypothecium fuscescent; spores 8, colourless, ellipsoid or oblong, simple; paraphyses indistinct; gelatina hymenea slightly cærulescent with iodine.

On alpine mosses, rare. 1860.

SYN :—Smmrf. Lapp. 156. (1826.) Nyl. Scand. 220. Mudd 200. T. M. Fries Scand. 540.
EXS :—Zw. 11. Th. M. Fries 20. Fellm. 163. Rabh. 734. 881. Smrft. 49.
GEOG. DISTRIB :—Greenland, Finmark, E. Lapland, Finland, Russia, Sweden, Norway.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers *Messrs. Jones & Carroll*, (1860.) Braedalbane and Braemar; summits of Lochnagar and Ben Macdhui, *Rev. J. M. Crombie.*
"Spores 0.013—18 mm. long, 0.0065—0.0075 mm. broad." (*Nyl.*) "Spores 0.013—18 mm. long, 0.006—8 mm. broad." (*T. M. Fries.*) "Spores .003—·004 in. long, .001—.0015 in. broad." (*Mudd.*) Spores .015—0175 mm. long, .0065—.0075 mm. broad.

92. *L. uliginosa*, (Schrad.) *fuscous or fusco-nigricant*, *minutely granulose*, *sub-leprose*, *effuse*, (K— C—); *apothecia fuscous-black* or *black*, plane or sub-convex, scattered or confluent, *darkish within*, margin entire evanescent; *hypothecium fuscous*; spores 8, colourless, ellipsoid, simple; *paraphyses indistinct*; gelatina hymenea reddish-brown with iodine.

On moist or turfy earth, common. 1799.

SYN :—Schrad. Spicil. 88. (1794.) Ach. Syn. 25. Nyl. Scand. 198. Mudd 197.
FIG :—E. Bot. 1466. Hepp Sporen t. 16. f. 132.
EXS :—Hepp 132. Mudd 167. M. & N. 747. Schær. 162. 163. Fellm. 150. Anzi It. S. 249. Leight. 120. Crombie 82.
GEOG. DISTRIB :—Sweden, E. Lapland, Germany, Switzerland, Hungary, Italy.
BOT. PROV :—1, 2, 3, 4, 5—10, 11...15, 16...(19—30)...31.
ENGLAND :—Near Yarmouth. *Mr. Turner.* (1799.) Surrey. *Mr. Borrer.* Kildale Moor! Baysdale Moor! Yorkshire. *Mr. Mudd.* Prestwick Carr; Cheviot, Northumberland; Redheugh and Eglestone, Durham. *Mr. Winch.* near Exeter. *Mr. Parfitt.* Warley Common; Mile-end near Colchester, Essex. *Mr. Varenne.* New Forest; Epping Forest; Hampstead Heath. *Rev. J. M. Crombie.* Reigate Heath. *Mr. W. Joshua.* Dartford, Brent, Ightham, Joydens wood, Bexley, Canterbury, Kent. *Mr. Holmes.* Mynydd-y-Myfyr! Caer Caradoc! Pontesford Hill! Wrekin Hill! Laurence Hill! Shropshire.
SCOTLAND :—Ben Lawers! *Sir W. J. Hooker.* Hill of Ardo; Trossachs; Appin. *Rev. J. M. Crombie.*
IRELAND :—Not uncommon. *Mr. Carroll.*
CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*
"Spores 0.008—0.017 mm. long, 0.004—8 mm. broad." (*Nyl.*) "Spores 0.008—17 mm. long, 0.004—8 mm. broad." (*T. M. Fries.*) "Spores 10—14 mikrml. long, twice as long as broad." (*Hepp.*) "Spores .003 in. long, by .00125 in. broad." (*Mudd.*) Spores .014—.015 mm. long, .007—.008 mm. broad.

forma *fuliginea*, (Ach.) only differs in the habitat on old stumps and wood, and is rarer.

SYN :—Ach. Syn. 35. Mudd Man. 198.
EXS :—M. & N. 1149. Anzi Langeb. 175. Arn. 649.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...8...10.
ENGLAND :—Sussex. *Adm. Jones.* Bilsdale; Kildale and near Ayton, Yorkshire. *Mr. Mudd.* Gopsall! Leicestershire. *Rev. A. Bloxam.* Kelvedon; Bocking, Essex. *Mr. Varenne.* Cabalin Lodge, Reigate. *Mr. W. Joshua.* Wrekin! Shropshire.
IRELAND :—Near Letterfrack. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Near St. Aubins, Jersey! *Mr. Larbalestier.*

Var. *humosa*, Leight. *cervino-lutescent, sub-squamuloso-granulate*, granules convex, coarse, more or less dispersed, (K— C—); apothecia concave, margined, at length convex, immarginate.

On earth and peat walls, rare. 1869.

SYN :—Crombie En. 67. Ach. Syn. 26.
EXS :—Reich. & Schub. 28. Leight. 354.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5...7...15.
ENGLAND :—New Forest, Hants. *Rev. J. M. Crombie.* Stiperstones Hill! Shropshire.
SCOTLAND :—Kincardine! Hill of Ardo, near Aberdeen. *Rev. J. M. Crombie.*
WALES :—Dolgelley. *Dr. Holl.* (1869.)

93. *L. Mooreana*, Carr. *greyish-white* or *cream-coloured*, thin, tartareous, *granuloso-verruculose, rugulose*, effuse, (K yellow then reddish); *apothecia black, large*, solitary or congregated, sessile, plane, *somewhat scabrous*, margin thin, entire, flexuose; *hypothecium thin, dark-brown;* spores 8, colourless, elliptico-oblong or ovate, simple.

On sub-alpine trap rocks, rare. 1859.

SYN :—Carroll Lich. Hib. 7. (1859,) Mudd Man. 207.
GEOG. DISTRIB :—Ireland.
BOT. PROV :—30.
IRELAND :—Crowglen! near Belfast. *Dr. Moore.*
"Paraphyses very slender, flexuose, mixed with much mucoso-gelatinous matter. Spores .0035—.004 in. long by .0015 in. broad." (*Mudd.*)

94. *L. mesotropiza*, Nyl. *white, verrucose, moderate*, (K yellow); *apothecia black, sometimes slightly pruinose*, convex, immarginate, *bluish-grey within;* spores 8, colourless, ellipsoid, simple; *epithecium dark-greenish-blue*; paraphyses not well discrete; gelatina hymenea bluish, thecæ violet-coloured with iodine.

On schistose stones. 1872.

SYN :—Nylander in Flora 1873. p. 17—23.
BOT. PROV :—15.
SCOTLAND :—Old wall on the hill of Ardo near Aberdeen, very sparingly. *Rev. J. M. Crombie.* (1872.)
"From *L. mesotropoides*, Nyl. its nearest ally, it differs amongst other characters by the verrucose thallus and bluish epithecium. Spores 0.011—12 mm. long, 0.007 mm. broad." (*Nyl.*)

95. *L. asema*, Nyl. *white*, thin, unequal, *sub-dispersed; apothecia black or livid-black*, margined, *often subplicate;* spores 8, colourless, ellipsoid, simple; epithecium glaucescent; *hypothecium reddish;* gelatina hymenea bluish, then tawny-wine-coloured with iodine.

On sandstone rocks. 1871.

SYN :—Nylander in Flora 1872. p. 356.
BOT. PROV :—31.

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.* (1871.)
"Allied to *L. sublatypea*, Leight. which differs in having black apothecia, a darker hypothecium and smaller spores. Spores 0.013—16 mm. long, 0.006—8 mm. broad." (*Nyl.*)

96. *L. callista*, Strn. *fuscous-black, granulose, granules dispersed or conglomerate; apothecia black, cæsio-pruinose*, small, sessile, *crowded, often contiguous, margin prominent inflexed; hypothecium fuscous-black, thin;* spores 8, colourless, elongato-ellipsoid or cylindrical, simple, small; paraphyses rather indistinct, thickish, apices clavate, fuscescent; gelatina hymenea I intensely-blue, almost black.

On alpine granitic rocks, rare. 1874.

SYN :—Stirton in Grevillea 3. p. 34. (1874.)
SCOTLAND :—Near Grantown, Inverness. *Dr. Stirton.* (1874.)
"Spores 0.012—014 mm. long, .003 mm. broad." (*Stirton.*)

97. *L. neglecta*, Nyl. *albido-cinereous*, thin, *granulose*, granules subconfluent, subdeterminate; *apothecia black, minute*, superficial, opake, somewhat plane, margin obtuse or at length evanescent, *internally almost concolorous or cinereo-nigrescent;* spores 8, colourless, fusiformi-oblong or oblong; paraphyses moderate; *hypothecium fuscescent;* gelatina hymenea I— or lutescent.

Amongst mosses in alpine places, rare.

SYN :—Nyl. in Sallsk. pro F. et Fl. F. Notis. 4. (n. ser. 1.) p. 233. Lich. Scand. p. 244.
EXS :—Arn. 601.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie.*
"Spores .008—.011 mm. long, .003—4 mm. broad." (*Nyl.*)

98. *L. pedatula*, Nyl. *whitish, granulose*, thin, (K yellow); *apothecia* black, minute, somewhat convex, immarginate, *stipitate*; *hypothecium stipitiform, rufescent*; hymenium cærulescent, epithecium darker; gelatina hymenea I slightly blue; spores not seen.

On rocks, very rare. 1876.

SYN :—Nyl. in Flora 1876. p. 236.
BOT. PROV :—26.
IRELAND :—Connemara. *Mr. Larbalestier.* (1876.)
"The attenuate stipes of the apothecium often exceeds the capitulum in height. Probably near *L. neglecta*." (*Nyl.*)

99. *L. livescens*, Leight. *white, granulose or granulato-verrucose; granules scattered* and dispersed, (K— C pale-reddish); *hypothallus* very *black* and *predominating; apothecia scattered, arising from the hypothallus, subinnate or innato-sessile*, round or angulari-difformed, *concave*, the disk or epithecium of a *pale-grey-livid* appearance, surrounded with a thick, prominent, *black*, entire or flexuose *margin*; hypothecium nigro-fuscous; paraphyses thick, apices brown; spores 8, colourless, linear-oblong, simple, very minute.

On rocks, rare. 1875.

SYN : –Leighton in Grevillea 4. p. 78.
BOT. PROV :—26.
IRELAND :—Doughruagh Mountain! Galway. *Mr. Larbalestier.* (1875.)
Spores .007 mm. long, .003 mm. broad.

100. *L. aniptiza*, Strtn. *nigro-cinereous or nigro-virescent, granulose*, thin; *apothecia black, small, prominent, convex, immarginate, papillose (as it were glomerate), internally* entirely *cinerascent;* spores 8, colourless, oblong or oblongo-cylindrical, simple; paraphyses irregular indistinct; gelatina hymenea I bright-blue; thalamium K slightly but distinctly purpurascent.

On decorticated wood, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 86. (1875.)
BOT. PROV :—15.
SCOTLAND :—Near Killiecrankie. *Dr. Stirton.* (1875.)
"Spores .0075—.011 mm. long, .0025—.003 mm. broad. The paraphyses are rendered distinct by K when they are seen, as slender, irregular, and occasionally branching filaments. Gonidia often conglomerate." (*Strtn.*)

101. *L. relicta*, Strtn. *nigro-cinereous*, rugose, *almost granulose; apothecia black, small, adnate, plane, obtusely marginate*, at length convex immarginate and rugose; spores 8, colourless, oblong, simple; paraphyses few, slender, distinct, pellucid, apices clavate, fuscous; *hypothecium fuscous-black;* gelatina hymenea I slightly blue then vinous-red.

On rocks, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 89. (1875.)
BOT. PROV :—15.
SCOTLAND :—Blair Athole. *Dr. Stirton.* (1875.)
"Spores .009—.013 mm. long, .005—.006 mm. broad." (*Strtn.*)

102. *L. meiococca*, Nyl. *pale-yellowish-sulphur-colour, coarsely granulate, areolato-diffract*, thickish, *(K yellow C—); apothecia brownish-black*, moderate, at first somewhat concave and with a thinnish margin, then plano-convex and depressed and immarginate, *adnato-sessile; hypothecium* thickish, *bright-fuscous, subtended by a pale cartilaginous excipulum*, slightly tinged with brown; hymenium pale, *paraphyses distinct, apices colourless;* spores 8, colourless, oblong, simple.

In deep recesses of maritime rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 578.
BOT. PROV :—26.
IRELAND :—Lettermore! Connemara. *Mr. Larbalestier.* (1876.)
Externally very similar in appearance to *Lecidea protrusa*, Fr. but with different reaction, as well as different nature of the hypothecium. Spores .0155 mm. long, .008 mm. broad. Gelatina hymenea I dark-vinous-fuscescent, especially the asci.

103. *L. humosa*, Ehrh. *olivaceo-virescent, minutely dispersogranulate; apothecia* fuscous-black or black, *innato-sessile, plane, with a slightly prominent pale margin; hypothecium brownish;* hymenium pale-brown, paraphyses cohærent; spores 8, colourless, oblong, simple.

On shady rocks, rare. 1876.

SYN :—Ehrh. Pl. Cr. Dec. 14. n. 135.
GEOG. DISTRIB :—Europe.
BOT. PROV :—26.
IRELAND :—Lough Inagh! Galway. *Mr. Larbalestier.* (1876.)
Spores .014 mm. long, .0085 mm. broad.

104. *L. continuior*, Nyl. similar to *L. latypea*, Ach. but differing only in the nearly *plane, rimoso-areolate thallus* (C orange).

On micaceo-schistose rocks, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 463.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1877.)

Var. *subviridans*, Nyl. yellow, plane, thin, areolato-diffract, sorediate, (C orange) ; excipulum nigricant ; hypothecium fuscous.
On walls, rare. (1877).

SYN :—Nyl. l. c.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1877.)

105. *L. uliginascens*, Stirt. *fuscous or fusco-nigricant, minutely granulose*, effuse ; *apothecia black, plane or subconvex, internally K violet ; hypothecium fuscous-black ;* paraphyses few, irregular, slender ; spores 8, colourless, oblong, simple.
On turfy earth, rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. p. 164. (1877.)
BOT. PROV :—16.
SCOTLAND :—Near Garve. *Dr. Stirton.* (1877.)
"[Gelatina hymenea I very pale-blue then dark-vinous-red. Spores .01—.013 mm. long, .006—.007 mm. broad." (*Stirt.*)

***** *Thallus areolate, areolæ convex or granular.*

† *Hypothecium pale or colourless.*

106. *L. aglæa*, Smmrf. *flavescent or ochroleucous and virescenti-cinereous*, crustaceous, thickish, *areolato-diffract, rimose, areolæ tumid, convex, generally minutely diffracto-insculpt* or *unequally rugose* or *smoothish, (K yellow C yellow)*]; *hypothallus black ; apothecia black, innate in the areolæ*, moderately large, *plano-convex, somewhat shining, immarginate, darkly cinerascent within ;* hypothecium pale, slightly rufescent ; spores 8, colourless, ellipsoid, simple ; thalamium cæruleo-cinerascent, epithecium cæruleo-nigricant ; paraphyses indistinct, apices fuliginous ; gelatina hymenea cærulescent with iodine.
On alpine rocks, rare. 1808.

SYN :—Smmrf. Suppl. Fl. Lapp. 144. (1826.) Nyl. Scand. 228. *L. Crombiei*, Jones ! Nyl. in Flora 1868. p. 345. Crombie Enum. 82 ! *L. viridiatra*, Borr ! Br. Fl. 2. 177.
FIG :—E. Bot. 1831.
EXS :—Zw. 23. Anzi Langob. 150.
GEOG. DISTRIB :—Norway, Finland, Sweden, Lapland, Switzerland, Hungary, Italy.
BOT. PROV :—7...11...15...19...26.
ENGLAND :—Near Winch Bridge ; near Whey-Syke, Teesdale Forest, Durham. *Rev. J. Harriman.* (1808.)
SCOTLAND :—Ben Lawers ! *Dr. Holl.* Glen Callater ; Ben Cruachan ! Khoil, Braemar. N.E. brow of Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND :—Mangerton. *Mr. Carroll.* summit of Diamond Mountain ! co. Galway. *Mr. Larbalestier.*
WALES :—Mynydd-y-Gader ! ! near Dolgelley. *Dr. Holl.* Cader Idris north escarpment ! Llyn Cwlyd ! Aran Mowddwy ! Llanbedrog ! Llyn Geirionydd ! Sychnant ! near Conway. Twll Du ! Glyder Vach ! Cwm Ffynnon lloer !
"Spores .010—16 mm. long, .006—8 mm. broad. I blue then dirty-violet. Spermatia sub-cylindrico-elongate 0.006—8 mm. long and 0.0010—15 mm. broad." (*T. M. Fr.*) "Spores .010—15 mm. long, .006—7 mm. broad." (*Nyl.*) Spores .014—.0145 mm. long, .007—8 mm broad. Medulla I—.
A remarkable species, readily recognised by the tumid convex areolæ of the thallus and the innate deep-black and shining apothecia.

107. *L. areolata*, Schær. *pallido-flavescent, crustaceous, thickish, areolate or areolato-diffract, rimose, areolæ plano-convex, smooth, (K yellow C yellow); hypothallus black; apothecia black, adnate to the areolæ, naked, opake*, moderate, *plano-convex, immarginate, cinerascent within; hypothecium colourless*, very slightly rufescent; spores 8, colourless, ellipsoid, simple; paraphyses crowded but distinct.

On schistose rocks in mountain ranges, rare. 1864.

SYN :—Schær. Spicil. 127. (1828.) Enum. 114. Crombie En. 82.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers! *Adm. Jones & Mr. Carroll.* (1864.)
The above description was drawn up from examination of the original specimen in Mr. Carroll's Herbarium, which was externally similar to *L. aglæa* and *L. Crombieii* and internally differed in no respect. I cannot but regard it as a state or variety of *L. aglæa*. Can our Scotch lichen be identical with Schærer's, which is described as having the areolæ of the thallus "candidæ" and the apothecia "intus alba!"

108. *L. tessellata*, (Flk.) *creamy* or *whitish*, tartareous, subdeterminate, *areolato-rimoso-diffract, areolæ angular, plano-convex, smooth*, opake, (K yellow then red); *apothecia* scattered or confluent, *sessile, adnate, black*, slightly pruinose, plane or sub-convex, internally white, margin thin, acute, elevated, flexuose; *hypothecium colourless, the margin only with a thin black line; epithecium nigricant;* thalamium pale-yellowish; spores 8, colourless, ellipsoid, simple, moderate, granular.

On alpine rocks, not common. 1870.

SYN :—Flk. D. Lich. 64. (1821.) Smmrf. Lapp. 144. Nyl. Scand. 227. Crombie Enum. 82. *L. spilota*, Fr. L. E. 297. pr. p.
GEOG. DISTRIB :—Scandinavia, Lapland, Sweden, France, Germany, Hungary, Italy, Switzerland.
BOT. PROV :—5...15...23.
ENGLAND :—Caer Caradoc! Shropshire.
SCOTLAND :—Ben Lawers. *Messrs. Jones and Carroll.*
IRELAND :—Lough Bray near Dublin. *Messrs. Jones & Carroll.*
"Spores 0.011—17 mm. long, 0.007—0.010 mm. broad." *(Nyl.)* Spores .011—16 mm. long, .006—.008 mm. broad. Medulla I—.

109. *L. spilota*, Fr. similar externally and internally to *L. tessellata*, Flk. but with a different chemical reaction K—C—.

On alpine rocks, not common.

I have never seen British specimens of the typical form, but the ferruginous state, forma *ochracea*, (Ach. L. U. 166) frequently occurs.
SYN :—Fries L. Eur. p. 297. (1831.) in part (specimen from Dr. Th. M. Fries.)
EXS :—Arn. 260. Hepp 723. Anzi Langob. 124. 125. 126.
GEOG. DISTRIB :—Germany, Switzerland, Italy, Hungary, Sweden.
Medulla I—.

forma *ochracea*, (Ach.) *thallus ferruginous; apothecia white within.*

On alpine rocks, not common. 1856.

SYN :—Ach. L. U. 166. (1810.) Crombie Enum. 82.
EXS :—Spruce Lich, Pyren. Anzi It. S. 272. Arn. 468. Schær. 188.
GEOG. DISTRIB :—France, Pyrenees.
BOT. PROV :—1...5...7...15.
ENGLAND :—Batheaston! *Mr. Broome.* Mynydd-y-Myfyr! near Oswestry, Shropshire.
WALES :—Between Bala and Dolgelley! (1856.) Pen-y-gwryd! Snowdon.
Medulla I—.

110. *L. mollis*, (Whlnb.) *cinereous* or *pallido-fusco-cinerascent, rimuloso-areolato-diffract, areolæ minutely albo-verrucose, convex, nigro-limitate*, (K yellow C yellow) ; *apothecia fuscous-black* or black, *superficial*, plane, margined, *whitish within* ; *hypothecium colourless ;* spores 8, colourless, ellipsoid, simple ; paraphyses distinct.

On mountain rocks, not unfrequent.

SYN :—Whlnb. Lapp. 172. (1812.) Nyl. Scand. 223.
EXS :—Fellm. 180. Mudd 168. Arn. 262. Leight. 302.
GEOG. DISTRIB :—E. Lapland, Norway, Germany.
BOT. PROV :—5...7...10...15.
ENGLAND :—Kildale Moor ! Battersby ! Cleveland. *Mr. Mudd.* Nesscliffe Hill ! Caer Caradoc ! Shropshire.
SCOTLAND :—Braemar ; Breadalbane. *Rev. J. M. Crombie.*
WALES :—Barmouth !

"Spores .007—8 mm. long, .005—6 mm. broad. Gelatina hymenea I slightly blue, then vinous-violet, especially the solid apices of the thecæ." (*Nyl.*) "Spores .007—9 mm. long, .005—6 mm. broad." *(T. M. Fr.)*

111. *L. mesotropa*, Nyl. *cinerascent, verrucoso-areolato-diffract, areolæ* plano-convex, *sub-squamose around the apothecia*, indeterminate, (K—C reddish) ; *apothecia fuscous-black or nigricant, opake*, somewhat plane, adnate to the areolæ, margin obtuse or evanescent, whitish within ; *hypothecium colourless ; epithecium fuscescent ;* spores 8, colourless, ellipsoid, simple ; paraphyses slender, indistinct.

On mountain schistose rocks, rare. 1867.

SYN :—Nyl. in Flora 1867. p. 328. Crombie En. 81.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben Lomond ! Craig Tulloch. *Rev. J. M. Crombie.* (1867.)

"Spores 0.009—0.013 mm. long, 0.005—6 mm. broad." (*Nyl.*) Spores .012 mm. long, .006 mm. broad.

112. *L. inserena*, Nyl. *darkly cinereous, rimoso-areolate* or areolato-granulose, areolæ often *scattered, hypothallus black, very conspicuous ;* apothecia black, plane ; *hypothecium with an opake white stratum in the lower portion ;* epithecium cærulescenti-fuscescent ; spores 8, colourless, ellipsoideo-oblong, simple ; *paraphyses indistinct ; gelatina hymenea cærulescent, then violet, especially the thecæ, with iodine.*

On quartzose mountain rocks, rare.

Resembling *L. tenebrosa* * *tumidior*, Nyl.
SYN :—Nyl. in Flora 1869. p. 84. En. 85.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.* (1869.)

"Spores .014—17 mm. long, .006—8 broad." (*Nyl.*)

113. *L. coarctata*, (Sm.) *whitish* or cinerascent, thin, rimulose or *areolato-granular* or sub-continuous or leprose, (K faint yellow or—C red) ; *apothecia fuscous, fusco-rufescent* or *blackish*, small, scattered, innate or sessile, *often with a white pulverulent, coarctate, spurious thalline margin ;* hypothecium colourless ; spores 8, colourless, ellipsoid, simple, large.

A very variable lichen, the principal forms of which are detailed below. "Spores .014—26 mm. long, .007—12 mm. broad." (*T. M. Fries.*) "Spores 014—20 mm. long, .007—11 mm. broad." (*Nyl.*) "Spores .0035—.00425 in. long, by .00175 in. broad." (*Mudd.*)

forma *elacista*, (Ach.) greyish-white, very thin, *effuse, leprose; apothecia* innate or sessile, concave or plane, *with a conspicuous white coarctate margin.*

On walls and stones, frequent. 1798.

SYN :—Ach. Meth. 159. (1803.) Syn. 149. Nyl. Prodr. 112. Mudd Man. 154.
FIG :—E. Bot. t. 534. (1798.) Ach. Meth. t. 4. f. 4. Hepp Sporen t. 21. f. 186.
EXS :—Nyl. L. P. 54, Schær. 312. Leight. 177.
GEOG. DISTRIB :—France, Switzerland, Hungary, Italy, Sweden.
BOT. PROV :—1, 2, 3, 4, 5...7...10, 11...15...30, 31.
ENGLAND :—Yarmouth. *Mr. Turner.* (1798.) Yorkshire! *Mr. Dickson.* Oswestry! Shropshire. *Rev. T. Salwey.* Newton Wood! near Ayton! Cleveland. *Mr. Mudd.* Gateshead Fell; Eglestone and Gainford, Durham; Heaton Dene and near Gosforth, Northumberland. *Mr. Winch.* Valley of Rocks, Linton, Devon. *Mr. Parfitt.* Braxted, Essex. *Mr. Varenne.* Plymouth, *Mr. Holmes.* Leith Hill, Surrey; Hastings. *Mr. W. Joshua.* Seven Oaks, Kent. *Mr. Holmes.* Wickliff Rocks! Ludlow; Hopton! near Nesscliffe; Nordy Bank, Abdon! Long Mynd! near Church Stretton, Shropshire.
SCOTLAND :—Killin! *Mr. Piggot.* Birnam Hill! Dunkeld. *Dr. Lindsay.* Craig Tulloch. Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—Near Belfast. *Mr. Templeton.*
WALES :—Moel-y-Golfa! Montgomeryshire. Pentregaer! near Oswestry! Cader Idris! Trefriw Falls! Eglwseg rocks!
CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*

forma *involuta*, (Tayl.) *greyish-white*, tartareous, *verrucose* or *areolato-granulose, verrucæ* often *scattered, convex* or *flattish; apothecia fusco-rufescent, concave* or more or less convex, sessile, *margin obliterated.*

On siliceous rocks, not unfrequent. 1836.

SYN :—*Lecanora*, Tayl.! in Mack. Fl. Hib. 2. 134. (1836.) Nyl. Scand. 196.
FIG :—Leight. Ang. Lich. t. 13. f. 4.
EXS :—Mudd 124. Hepp 186. Mass. 323.
GEOG. DISTRIB :—Germany, Hanover, Italy.
BOT. PROV :—5, 6, 7...10...19...26.
ENGLAND :—Newton Wood! Cleveland. *Mr. Mudd.* Haughmond Hill! Caer Caradoc! Sharpstones! Lyth Hill! near Shrewsbury, Shropshire.
IRELAND :—Carig! and Dunkerron Mountains. *Dr. Taylor.* (1836.) Mweerlan! Rynvyle! Dawros river! near summit of Doughruagh Mountain! Twelve Pins! co. Galway. *Mr. Larbalestier.*
WALES :—Yr Eifl! *Mr Holmes.* Cwm Glas! Snowdon. Trefriw falls! Cwm Cywion! Drwsynant! Pass of Llanberis! Aran Mowddwy: Eglwyseg rocks!
Spores .0195 mm. long, .015 mm. broad.

forma *glebulosa*, (Sm.) *whitish*, tartareous, *verrucoso-glebulose* or *sub-squamalose*, verrucæ *tumid*, scattered or crowded; *apothecia* minute, *rufo-fuscescent*, plane, margin thin, evanescent.

On shady rocks, not unfrequent. 1808.

SYN :—Sm. E. Bot. 1955. (1808.)
FIG :—E. Bot. 1955.
EXS :—Leight. 149.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...3...5...7, 8...10...15.
ENGLAND :—Great Ayton! Carlton Bank. Yorkshire. *Mr. Mudd.* near Exeter. *Mr. Parfitt.* Penzance, *Mr. Curnow.* Tunbridge Wells. *Mr. Holmes.* Caer Carodoc! Stableford! near Bridgnorth, Shropshire.
SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*
WALES :—Aberdovey!

forma *ornata*, (Smmrf.) *greyish-white, verruculose* or *areolato-squamulose, squamules flat* or more or less irregularly *convex, margins* more or less *crenate.*

On alpine rocks, rare.

SYN :—Smmrf. Lapp. 92. (1826.)
EXS :—Mudd 123.
GEOG. DISTRIB :—Norway, Pyrenees.
BOT. PROV :—3...5...7...10...15 . 26.
ENGLAND :—Guisbro' Moor! Cleveland. *Mr. Mudd.* Malvern Hills. *Dr. Holl.* Bergholt; Copford, Essex. *Mr. Varenne.* Church Stretton! Lyth Hill!
SCOTLAND :—Kinnoull Hill! Perth. *Dr. Lindsay.* Ben Lawers. *Dr. Holl.* Glen Nevis; Loch Callater. Craig Tulloch. *Rev. J. M. Crombie.*
WALES :—Cader Idris! Cwm Cwlyd!
IRELAND :—Doughruagh Mountain! Galway. *Mr. Larbalestier.*
Spores .022 mm. long, .011 mm. broad.

forma *dispersa*, Leight. convex verrucæ of thallus scattered and dispersed; hypothallus black, predominating; apothecia prominent, almost tubercular, spurious thalline margin conspicuous, minutely crenulato-laciniate.

On rocks, rare. 1875.

BOT. PROV :—26.
IRELAND :—Near Rynvyle! co. Galway. *Mr. Larbalestier.*

forma *variolosa*, Fw. *thalline margin white* and leprose or powdery, *connivent* over and concealing the epithecium.

On rocks.

This state is frequently observable in conjunction with *f. elacista.*
SYN :—Flotow Lich. Siles. 120. (1850.)
GEOG. DISTRIB :—Silesia, Hungary, Switzerland.
BOT. PROV :—5.
ENGLAND :—Nordy Bank! Shropshire.

forma *depauperata*, Leight. *thallus* entirely *obliterated, apothecia* naked and prominent.

On rocks and stones washed by water. 1866.

BOT. PROV :—7.
WALES :—Cader Idris! n.w. escarpment (1866.) Drwsynant! Aran Mowddwy! Pass of Llanberis! Cwm Cywion!
Spores .0225 mm. long, .0105 mm. broad.

forma *terrestris*, growing on the earth in crevices of rocks and walls.

WALES :—Moel-y-gest!

114. *L. prærimata*, Nyl. *white or whitish, continuous, rimose, rimæ subareolate* or *everywhere subparallelo-radiant, with convex or confluent soredia*, (K—C red); apothecia fuscous, biatorine, superficial, but imperfect and without spores.

On felspathic maritime rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 235.
BOT. PROV :—31.
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.* (1876.)
Possibly a subspecies of *L. coarctata*, with which it agrees in reaction of thallus.

115. *L. mesotropoides*, Nyl. *cinerascent, verrucoso-areolato-diffract*, areolæ *convex*, (K yellow, medulla I—); *apothecia fuscous-black or nigricant*, at first plane, margined, at length convex, prominent, immarginate, lamina thin, *excipulum circumcingent*; hypothecium colourless; spores 8, colourless, ellipsoid, short, simple.

On old limestone walls. 1871.

SYN :—Nylander in Flora 1872. p. 359.
BOT. PROV :—15.
SCOTLAND :— Craig Tulloch, Blair Athole. *Rev. J. M. Crombie.* (1871.)
"Externally similar to *L. mesotropa*, but with different reaction, thinner lamina and shorter spores. Spores 0.009—11 mm. long, 0.006—7 mm. broad. Spermatia 0.007—10 mm. long, scarcely 0.001 mm. broad." (*Nyl.*)

116. *L. caligans*, Nyl. *fuliginous-black*, thin, *rugose*, *diffract*, *indeterminate ; apothecia blackish*, *plane*, *obtusely margined*, *within pale* ; spores 8, colourless, *thinly acicular* ; epithecium colourless ; paraphyses not distinct ; hypothecium colourless, (excipulum somewhat brownish above) ; gelatina hymenea I vinous-red.

On maritime rocks, rare. (1873).

SYN :—Nyl. in Flora 1874. p. 10.
BOT. PROV :—31.
CHANNEL ISLANDS :—Alderney. *Mr. Larbalestier.* (1873,)
Allied to *L. egenula*, but a very distinct species, "Spores .030—35 mm. long, .0015 mm. broad." (*Nyl.*)

117. *L. pammicta*, Strn. *whitish or cinereo-albescent*, *thick*, *areolato-diffract*, *areolæ smooth*, *minutely papillose*, (K yellow then orange-red) *; apothecia black*, sessile, plane or somewhat convex, *margin undulate*, sometimes paler, internally pale ; hypothecium colourless ; *epithecium* almost constantly *gyroso-plicate ;* spores 8, colourless, ellipsoid, simple, rather small ; paraphyses thick, indistinct, apices clavate, nigricant ; gelatina hymenea I blue then violet.

On alpine rocks, rare. 1874.

SYN :—Stirton in Grevillea 3. p. 34. (1874.)
BOT. PROV :—15.
SCOTLAND :—Ben Arthur. *Dr. Stirton.* (1874.)
"Somewhat similar to *L. mollis*, (Whlnb.) and *L. tesselata*, (Flk.) Spores .008—.01 mm. long, .005—6 mm. broad." (*Stirt.*)

118. *L. tenebrosa*, (Flot.) *cinereo-nigricant* or *darkly-cinereous* tartareous, *rimoso-areolato-granulose*, often smooth, opake, *areolæ* more or less *tumid*, (K dirty yellow C dirty yellow) ; hypothallus black ; *apothecia small*, *sub-innate* in the areolæ, *black*, plane, margin thickish, eventually obliterated ; *hypothecium* colourless ; spores 8, colourless, ellipsoid, simple ; paraphyses distinct, except a dark discoloured line ; gelatina hymenea blue with iodine.

On alpine rocks, not common.

SYN :—Flotow in Herb. Nyl. Prodr. 127. Scand. 231. T. M. Fr. Scand. 540.
EXS :—Anzi Langob. 154. Rabh. 746. Anzi It. S. 212. Leight. 188.
GEOG. DISTRIB :—Sweden, Pyrenees, Bavaria, Germany, Lombardy, Italy.
BOT. PROV :—5...7...15...22, 23...31.
ENGLAND :—Malvern Hills. *Dr. Holl.* Abdon Burf ! Devil's Chair ! Stiperstones ; Caer Caradoc ! Shropshire.
SCOTLAND :—Braemar ; near Portlethen ; Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Killarney and Lough Bray, Dublin ; Luggelaw, Wicklow. *Adm. Jones.*
WALES :—Cwm Ffynnon lloer !
CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier.*
"Spores .011—17 mm. long, .006—7 mm. broad." (*Nyl. & T. M. Fr.*) Spores .0125—.014 mm. long, .0055 mm. broad. Medulla I reddish.

119. *L. asperella*, Strtn. *black*, *thickish*, *granuloso-furfuraceous*, *diffracto-areolate*, determinate ; *apothecia black*, *small*, *adnate*, shining, plane, *margin thin shining* ; *hymenium* seen in a thin section

entirely *cæruleo-virescent*; spores 8, colourless, ellipsoid or oblongo-ellipsoid, simple; paraphyses not very distinct, apices clavate cærulescent, (violet-purple with nitric acid); *hypothecium colourless, subtended by a fuscous-black excipulum;* gelatina hymenea I intensely and persistently blue.

On rocks. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 87. (1875.)
BOT. PROV :—15.
SCOTLAND :—Ben-y-gloe. *Dr. Stirton.* (1875.)
"Spores .0075—.01 mm. long, .004—.005 mm. broad. Very closely allied to *L. furvella*, Nyl. The stratum beneath the hypothecium is composed of large cells intermingled with branching fibres (which, however, prevail more in the lower portion) and is accordingly, quite unlike the usual excipie." *(Stirtn.)*

### †† *Hypothecium dark.*

120. *L. panæola*, Ach. *albido-cinereous* or creamy or pale-tawny, *areolato-granulose, areolæ large, tumid, rimoso-diffract*, flattish or sub-convex, smooth, more or less polished, (K faint yellow C red) *with tuberculose* reddish *cephalodia* intermixed, *hypothallus dark brown; apothecia* black or nigro-fuscous, *appressed* or *immersed*, plane or sub-concave, more or less pruinose, margin thin, prominent, smooth; *hypothecium thick, dark-brown;* spores 8, colourless, ellipsoid, simple, *very large*, with broad epispore; paraphyses slender, apices fuscous; gelatina hymenea intense-blue with iodine.

On granitic rocks in alpine localities, not uncommon. 1807.

forma *vera*, Leight. *apothecia* prominent, *adnate or appressed, margin prominent*, often paler than the epithecium.

SYN :—Ach. L. U. 201 (1810) Syn. 33. Nyl. Scand. 225. *Aspicilia athroocarpa*, Mudd Man. 164. *L. cechumena*, Tayl. Fl. Hib. 2. 117.
FIG :—E. Bot. 1829.
EXS :—Schær. 469. Fellm. 182. Smrft. 51. Anzi Langob. 83.
GEOG. DISTRIB :—E. Lapland, Sweden, Switzerland.
BOT. PROV :—5...7...11...15...19...25, 26...30.
ENGLAND :—Cronkley and Egleston, Durham. *Rev. J. Harriman.* (1807.) Teesdale! *Mr. Robertson.* Abdon Burf! Shropshire.
SCOTLAND :—Ben Lawers! *Mr. Carroll.* Ben Cruachan; Craig Guie; Khoil. *Rev. J. M. Crombie.*
IRELAND :—Carig Mountain! *Dr. Taylor*, Tollymore Park. *Dr. Maingay.* Connor Cliff; summit of Brandon co. Kerry; Galtimore, Tipperary, *Mr. Carroll.* near Belfast. *Dr. Moore.* co. Antrim. *Adm. Jones.* Kylemore Castle! co. Galway; Doughruagh! *Mr. Larbalestier.*
WALES :—Rocks above Corwen! *Rev. T. Salwey.* Llyn Bodlyn. *Mr. Holmes.* Cwm Glas! Snowdon; Llyn Aran! Llyn y Cae! Cader Idris! Cwm Bach! Cwm Cywion! Cwm Tryfaen! Cwm Bochlwyd! Llyn Cwlyd! Glyder Vach! Aran Mowddwy! Cwm Clwyd! Bettws-y-coed! Trefriw! Moel-y-gest!
"Spores .017—27 mm. long, .008—12 mm. broad." *(T. M. Fr.)* "Spores .018—34 mm. long, .010—16 mm. broad." *(Nyl.)* "Spores .006—.008 in. long, by .0035—.004 in. broad." *(Mudd.)* Spores ·0295—.032 mm. long, .016 mm. broad.

forma *subconsentiens*, Leight. *apothecia concave*, immersed in the areolæ, *immarginate*, but with a *spurious thalline margin.*

On alpine granitic rocks, not common. 1871.

BOT. PROV :—7.
WALES :—Cwm Cywion! Cwm Ffynnon Llugwy! Cwm Ffynnon Lloer! Glyder Vach! Aran Mowddwy!

A conspicuous form, but intermediate states may be observed between this and f. *vera*. Paraphyses distinct, apices fuscous, lateral excipulum colourless, hypothecium central, dark fuscous. Spores with very thick epispore, double the size of those of *L. consentiens*, which this form externally assimilates. Spores—.033 mm. long, .0175—.019 mm. broad.

forma *obliterata*, Leight. *thallus* smooth, creamy, thin, effuse, *nearly denuded*, probably by water, with cephalodia; *apothecia prominent*, with conspicuous *proper margin*.

On alpine rocks, rare. 1871.

Bot. Prov :—7.
Wales :—Cwm Cywion!
Hypothecium nigro-fuscous, thick; paraphyses distinct; spores 8, colourless, with narrow epispore, .038 mm. long, .018 mm. broad.

121. *L. fusco-cinerea*, Nyl. *cinerascent or cinereo-fuscous*, effuse; *rimoso-areolate*, *areolæ* often *verrucæform or tuberculate*; hypothallus black; apothecia closely appressed or adnate, plane, margin thin prominent; *hypothecium nigro-fuscous; paraphyses concrescent*, apices fuliginous very obtuse and thickly clavate; spores 8, colourless, oblong or ellipsoid, simple; gel. hym. I slightly blue, then vinous-red.

On alpine rocks.

Syn :—Nyl. Bot. Not. 1852 p. 177. T. M. Fr. Scand. 527.
Fig :—Nyl. Obs. Lich. Holm. fig. 9.
Exs :—Arn. 114. 227. Fr. L. Suec. 406 C.
Geog. Distrib :—Sweden, Norway, Finland, Germany.
Bot. Prov :—7.
Wales :—Cwm Idwal! Llyn Geirionydd!
Externally like *L. tenebrosa*, but internally different. "Spores .009—14 mm. long, .006—10 mm. broad." (*T. M. Fr.*) "Spores .014—20 mm. long, .007 mm. broad." (*Nyl.*) Spermatia shortly acicular, straight. Spores .012—.015 mm. long, .006 mm. broad. Medulla I reddish. Thallus K dirty-yellow C reddish.

122. *L. Bruyeriana*, (Schær.) *pale-yellow*, *verrucoso-glebulose*, verrucæ tumid, scattered or concrete, often evanescent, (K yellow, C apothecia red but thallus yellow); *apothecia large*, *sessile*, *concave*, *fuscous or black*, *margin thick*, *incurved*, entire or flexuose; *hypothecium black*; spores 8, colourless, ellipsoid, large, simple, granular; paraphyses distinct; gelatina hymenea yellow with iodine.

On alpine rocks, rare. 1866.

Syn :—Schær. Enum. 77. (1850).
Fig :—Hepp Sporen t. 70. f. 615.
Exs :—Schær. 539. Hepp. 615.
Geog. Distrib :—Switzerland.
Bot. Prov :—7...11.
England :—Force Garth, Teesdale. *Dr. Holl.*
Wales :—Craig-y-llam near Dolgelley. *Dr. Holl.* Cader Idris! (1866). Aran Mowddwy! Moel-y-Golfa!

Bot. Prov :—7...10...15.
f. *ochrodes*, *Nyl.* found in Glen Callater 1872 by *Dr. Stirton*.
Spores, .0195 mm. long, .009 mm. broad. The large apothecia have much the appearance of a Peziza.

123. *L. Kochiana*, Hepp. *mouse-colour* or *pale-cinereo-fuscescent*, *rimoso-areolato-diffract*, *areolæ plano-convex*, nigro-limitate, (K—C—); *apothecia* black, *innate*, *immarginate*, flexuoso- or anguloso-

deformed, *disk plane, somewhat shining and smooth, internally dusky; hypothecium a thin nigro-fuscous line resting on the hypothallus;* spores 8, colourless, oblong, simple; paraphyses distinct.

On alpine rocks, not unfrequent.

SYN :—Hepp Wurtz. 61. (1824.) Nyl. Scand. 322.
EXS :—Schær. 181. M. & N. 549. Zw. 6, Anzi It. S. 251.
GEOG. DISTRIB :—Switzerland, Pyrenees, Spain, Germany, Norway.
BOT. PROV :—7...15...31.
SCOTLAND :—Kincardine ! Braemar. *Rev. J. M. Crombie.*
WALES :—Pen-y-gwryd. *Mr. W. Joshua.* Barmouth ! Snowdon ! Cader Idris ! Trefriw !
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
IRELAND :—near Letterfrack ! *Mr. Larbalestier.*
"Spores .008—11 mm. long, .006—8 mm. broad." *(Nyl.)* Spores .01—011 mm. long, .006—7 mm. broad. Medulla I—.

Var. *lygæa*, Ach. *umber-coloured*, effuse, *continuous, smooth, slightly rimulose*, (K—C—); *apothecia* minute, *adpresso-sessile, plano-convex, smooth, immarginate*, nigro-fuscous, internally dusky.

On rocks, rare. 1865.

SYN :—Ach. Syn. 34. excl. var. (1817.) Nyl. Scand. 223.
GEOG. DISTRIB :—Switzerland, Pyrenees, Lombardy, Italy.
BOT. PROV :—7...26...31.
WALES :—Cwm Glas ! Snowdon. (1865.) Nant Gwynant ! Snowdon.
CHANNEL ISLANDS:—Boulay Bay ! Jersey. *Mr. Larbalestier.*
IRELAND :—Delphi Mountains, Connemara ; Lough Muck. *Mr. Larbalestier.*
"Spores .008—11 mm. long, .006—8 mm. broad." (*T. M. Fr.*) Medulla I.

124. *L. segregans*, Nyl. *whitish* or *albido-cinerascent, verrucoso-granulose, granules* various, somewhat *convex*, more or less segregate or verrucoso-confluent, laxly adnate; hypothallus nigricant, scarcely visible; *apothecia black*, somewhat plane, immarginate, at length convex, and *often aggregato-confluent, small, concolorous within; hypothecium fuscous;* epithecium scarcely obscurate; spores 8, colourless, oblong, simple; hymenium dusky; paraphyses moderate, scarcely distinct; gelatina hymenea dilutely-cærulescent then vinoso-fulvescent with iodine.

On alpine micaceo-schistose rocks, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 372. Crombie En. 92.
EXS :—Rabh. 768. Anzi Langob. 121. Schær. 626.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben. Lawers. *Adm. Jones.*
Systematically probably near *L. melancheima*, Tuck. "Spores .010—13 mm. long, .0035—.0045 mm. broad." (*Nyl.*)

125. *L. symphorella*, Nyl. whitish or albido-cinerascent, areolate, areolæ convex more or less scattered and dispersed, (K yellow C yellow); *apothecia black*, minute, somewhat convex, immarginate, *aggregato-acervulate*, acervuli composed of many connate apothecia, *internally concolorous*, sessile upon and nearly obliterating the areolæ; spores 8, colourless, lineari-oblong, simple, the contents having a tendency to separate into 3 nuclei or cells; paraphyses moderate, indistinct; epithecium darkly-fuscescent; *hypothecium*

*brunneo-infuscate;* gelatina hymenea and asci at first blue, then red or vinous-violet with iodine.

On weathered quartzose stones, rare. 1869.

SYN :—Nyl. in Flora 1870. p. 35. Crombie in Seem. Journ. Bot. 8. 99.
EXS :—Crombie 89.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Summit of Morrone; Braemar! *Rev. J. M. Crombie.* (1869.)
Apparently very near to *L. segregans.* "Spores .010—18 mm. long, .004—7 mm. broad." *(Nyl)* Spores .019—.02 mm. long, .0055 mm. broad.

126. *L. commaculans*, Nyl. *fuscous-black* or *nigricant*, thin, opake, sub-areolate, areolæ depressed, generally dispersed, indeterminate; *apothecia black*, somewhat convex, with scarcely any margin, *concolorous within; hypothecium thickish, rubricoso-fuscous*, this colour passing upwards into the thalamium; epithecium nigricant; spores 8, colourless, oblong, or linear-oblong, simple; paraphyses indistinct; gelatina hymenea cærulescent with iodine.

On felspathic boulders, rare. 1868.

"Approaching *L. Kojanita*, in which the spores are different and the thalamium not tinged with red, but more allied to *L. dispansa*, Nyl. Spermatia cylindrical straight. Spores 0.008—0.011 mm. long, 0.003—4 mm. broad.' *Nyl.* Hypothecium has the same reddish tinge which is produced by K on the hypothecium of *Lecanora subfusca var. coilocarpa*, and this colour passes without distinguishable tint into the thalamium.
SYN :—Nyl. in Flora 1868. p. 476. Crombie En. 93.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Morrone! Braemar. *Rev. J. M. Crombie.*
Spores .01—.011 mm. long, .003—4 mm. broad.

127. *L. amphotera*, Leight. *white, tartareous, areolato-diffract, areolæ of compound clustered convex granules*, (K yellow C yellow); *apothecia fuscous, clustered* or *conglomerate, innate, prominent*, large, immarginate; *hypothecium fuscous*, thickish; paraphyses crowded, but distinct; spores 8, colourless, lineari-oblong, simple.

On alpine rocks, rare. 1870.

BOT. PROV :—7...15.
SCOTLAND :—Hill of Ardo near Aberdeen. *Rev. J. M. Crombie.* (1870.)
WALES :—Conway!
The thallus of this has the general appearance of that of *Pilophoron fibula* with its fuscous cephalodia, and the spores resemble those of *Lecidea lapicida*, from which the nature of the thallus and the different hypothecium distinguish it. Spores .0175 mm. long, .005 mm. broad.

128. *L. dealbatula*, Nyl. *white*, thin, rimose or scatteredly *convexo-subareolate*, unequal, (K—C—); *apothecia black, small*, prominent, margined, *umbonate* or at length subgyrose in the centre, concolorous within; spores 8, colourless, ellipsoid, simple, minute; *epithecium and hypothecium nigro-fuscous;* paraphyses moderate, distinct but coherent; gelatina hymenea I intensely-bluish.

On schistose and hard-grained rocks, rare. 1874.

SYN :—Nyl. in Flora 1874. p. 315.
BOT. PROV :—7...15...26.
SCOTLAND :—Stronaclachan, Killin. *Rev. J. M. Crombie.* (1877.)
IRELAND :—Kylemore Castle! co. Galway. *Mr. Larbalestier.*

WALES :—Trefriw ! near Llanrwst.
"Allied to *L. deparcula, Nyl.* Spores 0.010–12 mm. long, 0.006—8 mm. broad." (*Nyl.*)

129. *L. silacea*, Ach. *bright-ferruginous-red*, areolate, *areolæ verrucoso-granulate, convex*, tumid, smooth, (K— C—); *apothecia dark-bluish or violet-black*, numerous, scattered or crowded, various in size, *closely adnate* on or between the areolæ, plane or convex, margin entire or flexuose; *hypothecium dark-fuscescent, subtended by a darker-excipulum;* hymenium bluish, paraphyses distinct, apices violet-black; spores 8, colourless, roundish-oblong, simple, small; I intense-blue.

On alpine rocks, probably not uncommon. 1870.

SYN :—Ach. Prodr. p. 66 (1794) Syn. 22. Nyl. Scand. 225. T. M. Fr. Scand. 487.
FIG :—Mass. Ric. fig. 123.
EXS :—Schær. 190. 191. Anzi Langob. 159.
GEOG. DISTRIB :—Sweden, Norway, Finland, Switzerland, Italy.
BOT. PROV :—15.
SCOTLAND :—Glen Fender ! Blair Athole. *Rev. J. M. Crombie* (1870.)
" Spores .008—11 mm. long, .005—6 mm. broad." (*T. M. Fr.*) Spores .01 mm. long, .005— .0055 mm. broad.

130. *L. calpodes*, Strtn. *darkly-cinereous, areolato-diffract, areolæ somewhat convex*, contiguous or dispersed; *apothecia black, minute*, very numerous, *innato-sessile, concave, suburceolate, acutely margined*, at length somewhat explanate, internally pale or pallido-fuscescent; spores 8, colourless, ellipsoid, almost spherical, simple; paraphyses irregular, indistinct, apices fuscescent; *hypothecium fuscous or pallido-fuscescent*, thin; gelatina hymenea I slightly blue then vinous-red.

On rocks, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 88 (1875.)
BOT. PROV :—15.
SCOTLAND :—Killiecrankie. *Dr. Stirton* (1875.)
"Spores .007—.0085 mm. long, .006—.007 mm. broad. K renders the paraphyses as distinct, filiform, irregular, branching fibres." (*Strtn.*)

131. *L. Mullensis*, Stirt. *cinereous or nigro-cinereous, areolato-verrucose, diffract, (K yellow, internally yellow then ferruginous-red) formed of erect columellæ*, which are either connate or segregate and dispersed; *apothecia black, subinnate*, small, plane, acutely margined, margin often flexuose or undulate; *hypothecium thickish*, fuscous or *fuscous-black*; paraphyses very irregular and indistinct; nigro-apiculate; *spores 8, colourless, ellipsoid, simple.*

On rocks, rare. 1877.

SYN :—Stirton in Scottish Naturalist. 4. 166 (1877.)
BOT. PROV :—16.
SCOTLAND :—Mull. *Dr. Stirton.* (1877.)
"Spores .006—.009 mm. long, .004—006 mm. broad. Gelatina hymenea I bluish, then vinous-red. Hymenium K yellow, then with stellate groups of reddish acicular crystals. Asci with thick pellucid walls upwards." (*Stirt.*)

****** *Thallus areolate, areolæ flat or plane.*

† *Hypothecium pale.*

133. *L. polycarpa*, Flk. *cinerascent*, very thin, tartareous,

*minutely rimuloso-areolate, areolæ plane or plano-convex, smooth,* somewhat evanescent, (K yellow then red); hypothallus black; *apothecia* numerous, scattered or aggregate, *adnate, plane, opake, black, soft, velvety,* margin very thick, subtumid, prominent, flexuose; *hypothecium pale or more or less rufescent, with short lateral black excipulum;* epithecium nigricant; thalamium pale; spores 8, colourless, elliptical, simple, binucleolate.

On alpine rocks, frequent.

SYN :—Flk. in Smmrf. Suppl. Lapp. 149. (1826.) Nyl. Scand. 226.
EXS :—Fellm. 189.
GEOG. DISTRIB :—E. Lapland, Scandinavia, Hungary, Sweden, France.
BOT. PROV :—5...7...15...19.
ENGLAND :—Devil's Chair! Stiperstones, Shropshire.
SCOTLAND :—Morrone; Ben-na-boord; Ben Cruachan; Ben Lawers; Ben Nevis; Braemar. *Rev. J. M. Crombie.*
IRELAND :—Mangerton. *Mr. Carroll.*
WALES :—Cader Idris, north escarpment! Craig Breidden! Nevin! Eglwyseg rocks! Llyn Geirionydd! Barmouth!
"Spores .009—.014 mm. long, .004—7 mm. broad." *Nyl.* "Spores .009—12 mm. long, .005 mm. broad. I blue then discoloured, asci violet-red or fulvescent. Spermatia shortly acicular, straight or slightly curved .009—12 mm. long." (*T. M. Fries.*) Medulla I blue. Spores .015 mm. long, .005 mm. broad.

Var. *declinans,* Nyl. nearly ecrustaceous; *hypothecium fuscous* or *fusco-rufescent,* (K yellow then red).

SYN :—Nyl. Scand. 226. (1861.) Crombie Enum. 81. Leight. in Ann. and Mag. Nat. Hist. June, 1867.
EXS :—Fellm. 187. 188. Rabh. 844.
GEOG. DISTRIB :—E. Lapland, Scandinavia.
BOT. PROV :—7..15...23.
SCOTLAND :—Castleton, Braemar. *Adm. Jones.*
IRELAND :—Killiney Hill. *Dr Moore.*
WALES :—Cader Idris, north escarpment! Pass of Llanberis!

133. *L. marginata,* Schær. *pale-apricot-colour,* tartareous, macular, diffuse, *rimuloso-areolato-diffract,* areolæ plane, unequal, (K yellow); apothecia black, sessile, plane or tumid, margin thick, prominent, sometimes flexuose, at length obliterated; *hypothecium pale;* spores 8, colourless, oblong, simple, I blue.

On alpine rocks, rare. 1868.

SYN :—Schær. Enum. 115. (1850.) Crombie Enum. 83.
EXS :—Schær. 189.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—2...15.
ENGLAND :—Isle of Wight. *Dr. Holl.*
SCOTLAND :—Ben Lawers. *Adm. Jones.* (1868.)
Spores .015—.0115 mm. long, .0065—.0075 mm. broad.

134. *L. lapicida,* Fr. *cinerascent,* tartareous, thin, *areolato-rimoso-diffract, areolæ flat or plane,* (K—C—); hypothallus black; *apothecia* numerous, small, scattered or aggregate, *plane, opake, raven-black, soft, velvety,* margin thin, obtuse, slightly prominent, flexuose; *hypothecium pale, with a thin blackish wavy line subtending the sides and base;* epithecium nigricant; thalamium pale and yellowish; spores 8, colourless, narrowly oblong, simple, often with 2 nuclei; paraphyses distinct, apices nigricant.

On alpine rocks, frequent.

SYN :—Fries. L. E. 306. (1831.) Nyl. Scand. 225. Nyl. ! Obs. Holm. 2. (1853.) Mudd Man. 209.
EXS :—Zw. 130. Leight. 157.
GEOG. DISTRIB :—Scandinavia, Germany.
BOT. PROV :—5...7...10...15...28, 29, 30.
ENGLAND :—Cleveland. *Mr. Mudd.* Mynydd-y-Myfyr near Oswestry ! Bodbury Ring near Church Stretton ! Abdon Burf ! all in Shropshire.
SCOTLAND :—Breadalbane ; Blair Athole ; Braemar. *Rev. J. M. Crombie.*
IRELAND :—North. *Dr. Moore.*
WALES :—Nant Gwynant ! Crib Coch ! Snowdon. Cwm Bochlwyd !
"Spores .003 in. long by .001 in. broad." *(Mudd.)* "Spores .008—.012 mm. long, .004—7 mm. broad." *(Nyl.)* "Spores .009—13 mm. long, .004—6 mm. broad." *(T. M. Fr.)* Spores .011—.0125 mm. long, .003—4 mm. broad. Medulla I—.

Var. *ochracea*, ferruginous-red.
On alpine rocks, not common.

GEOG. DISTRIB :—Europe.
BOT. PROV :—7...15...30.
SCOTLAND :—Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—Clogan Mountains co. Antrim. *Dr. Moore.*
WALES :—Nant Gwynant ! Snowdon ; Cwm Clyd !

135. *L. lithophila*, Ach. *cinerascent*, tartareous, thin, *rimuloso-areolate*, areolæ plane, (K—C—) ; hypothallus black ; *apothecia* numerous, small, scattered or aggregate, *plane, opake, black, or nigro-rufescent, soft, velvety*, innate or sessile, margin thin, prominent, flexuose ; *hypothecium pale, slightly obscurate ;* epithecium rufescent when moistened ; thalamium pale ; spores 8, colourless, oblongo-ellipsoid, simple ; paraphyses distinct.
On alpine rocks, frequent.

SYN :—Ach. Syn. 14. (1817.) Nyl. Scand. 226.
EXS :—Fellm. 190.
GEOG. DISTRIB :—E. Lapland, Scandinavia, Madeira.
BOT. PROV :—1...6, 7...12...15...20.. 26.
ENGLAND :—Stavely near Kendal. *Mr. Martindale.* Cornwall. *Dr. Holl.*
SCOTLAND :—Ben Lawers ; Morrone ; Glen Fender ; Blair Athole. *Rev. J. M. Crombie.*
WALES :—Cader Idris, north escarpment ! Nant Gwynant ! Snowdon ; Drwsynant ! Llyn Geirionydd ! Gimlet Rock ! Pwlhelli. road between Fishguard ! and Newport, Pembrokeshire.
IRELAND :—Blackrock. *Mr. Carroll.* Killery Bay. *Mr. Larbalestier.*
"Spores .009—12 mm. long, .005—6 mm. broad. I intense-blue. Spermatia acicular, nearly straight, .012—15 mm. long." *(T. M. Fr.)* "Spores .011—15 mm. long, .006—7 mm. broad." *(Nyl.)* Spores .01—013 mm. long, .0045—006 mm. broad.

136. *L. plana*, Lahm. *cinereous*, or glaucescenti-whitish, rimoso-areolate, *areolæ plane*, (K—C—) ; *apothecia black*, opake, small, adnate, *variously angulose* by confluence or compression, plane, margin thin, entire or flexuose ; *hypothecium colourless, with a brown lateral excipulum extending about half way under the hypothecium ;* paraphyses distinct, but cohærent, apices fuscescent ; spores 8, colourless, narrow-oblong or lineari-oblong, simple ; I intense deep-violet-blue.
On sub-alpine rocks, rare.

SYN :—Körb. Par. 211. (1861.) Nyl. in Flora 1873. p. 552. T. M. Fries Scand. 497. *L. lapicida var. lithophilo des*, Nyl. Leight. Lich. Fl. 285.
EXS :—Nyl. Pyren. Or.
GEOG. DISTRIB :—Sweden, Norway, Germany, Eastern Pyrenees.
BOT. PROV :—15.

SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*
"Spores .011—15 mm. long, .0035—.0045 mm. broad." *(Nyl.)* "Spores .009—12 mm. long, .0025—40 mm. broad. I intense-blue." (*T. M. Fries.* Spores .013 mm. long, .004 mm. broad.

137. *L. rivulosa*, Ach. *mouse-coloured* or pallido-fusco-cinerascent, *rimuloso-areolato-diffract*, *areolæ plane*, nigricanti-limitate, (K— C—) ; *apothecia fuscous-black*, moderate, *sessile*, *margin thin*, *paler*, *flexuose*, *disk* plane, opake, *minutely granuloso-papillate*, *internally entirely whitish ;* hypothecium pale ; spores 8, colourless, oblong, slightly curved, simple ; paraphyses distinct, apices fuscous.

On mountain rocks, common. 1807.

SYN :—Ach. Meth. 38. (1803.) Syn. 28. Nyl. Scand. 222. Mudd Man. 199.
FIG :—E. Bot. 1737. Hepp Sporen t. 57. f. 491.
EXS :—Zw. 7. 93. Hepp 491. Nyl. 59. Fries 404.
GEOG. DISTRIB :—Sweden, France, Germany, Italy, Switzerland.
BOT. PROV :—1...3, 5...7...10, 11...18, 19...26, 31.
ENGLAND ;—Kildale ! Ayton Moor ! Yorkshire. *Mr. Mudd.* Horsleyhope Bourn, Durham. Wooler Water foot of Cheviot, Northumberland. *Mr. Winch.* Sheepstor, Devon. Ightham, Sharpitor, Kent. *Mr. Holmes.* Mynydd-y-Myfyr ! Oswestry, Shropshire.
SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay.* Braemar. *Rev. J. M. Crombie.*
IRELAND :—Near Glengariff ! *Mr. Carroll.* Delphi, Connemara. *Mr. Larbalestier.*
WALES :—Holyhead ! Barmouth !
CHANNEL ISLANDS :—Le Fret ! Jersey ; Jerbourg ! Guernsey. *Mr. Larbalestier.*
"Spores .009—12 mm. long, .004—6 mm. broad. I blue then vinous-red, especially apices of asci. Spermatia cylindrical, slender, straightish or curved, .004 mm. long, .001 mm. broad." (*T. M. Fries.*) "Spores .009—.012 mm. long, .0045—.0055 mm. broad." *(Nyl.)* "Spores .0025 in. long by .001 in. broad." *(Mudd.)* Spores .012 mm. long, .0055 mm. broad. I deep-blue. The excipulum is laterally and externally fuscous, and may be frequently traced under the entire pale hypothecium. The internal contents of the spores have a tendency to constriction and division in the middle. In the typical form the thallus is thicker and more crustaceous, and verrucoso-areolate.

forma *depressa*, Leight. *minutely* areolato-rimose, *areolæ depressed*, *flat*, *plane*, sometimes slightly concave ; apothecia sessile.

On mountain rocks, frequent.

EXS :—Rabh. 775. Anzi Ital. S. 250. Langob. 162.
GEOG. DISTRIB :—Germany, Italy.
BOT. PROV :—7...20.
IRELAND :—West Cork ! *Mr. Carroll.*
WALES :—Pass of Llanberis ! Holyhead ! Crib Coch ! Snowdon. Llyn Cwlyd ! Tanybwlch Wood ! Capel Curig.

forma *obscurior*, Crombie. thallus areolato-rimose, of a *dark dusky* colour caused by the intersection and predominance of the serpentine lines of the brownish-black hypothallus ; apothecia sessile.

On mountain rocks, not common. 1865.

BOT. PROV :—7.
WALES :—Glyder Vach ! Aran Mowddwy ! Llyn y Ddinas, near Beddgelert !

forma *depauperata*, Leight. thallus *evanescent*, *leaving only the dusky hypothallus ;* apothecia sessile.

On quartzose rocks and boulders, rare. 1871.

BOT. PROV :—7.
WALES :—Cwm Cywion ! Nant Francon (1871.)
There is a corticolar form represented by Hepp 730. Rabh. 808. T. M. Fries 43. Zw. 267. growing on Beech and Birch in Scandinavia and Germany, but not yet detected in Great Britain.

138. *L. atrofuscescens*, Nyl. *cinereo-nigricant* or *fusco-nigrescent, deplanate, areolato-diffract, sub-opake, areolæ plane* or *flat;* hypothallus black, here and there visible; *apothecia black, adnate, plane*, at length somewhat convex, margined, moderate, often sub-angulose, *nearly colourless within; hypothecium colourless;* epithecium fuscescent; spores 8, colourless, ellipsoid, simple; paraphyses slender, sub-irregular; gelatina hymenea cærulescent, then partly vinoso-rubescent with iodine.

On micaceo-schistose rocks, rare. 1864.

SYN :—Nyl. in Flora 1866. p. 371. Crombie En. 83.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Lower slopes of Ben Lawers! *Mr. Carroll.* (1864).
Intermediate between *L. fuscoatra* and *tenebrosa*, but distinguished by the larger spores and other characters. "Spores .018—20 mm. long, .009—.011 mm. broad." (*Nyl.*)

139. *L. lithophiliza*, Nyl. *cinerascent*, firm, *unequally deplanate, areolato-diffract* or areolato-rimose, thin, rhagadiose, (K yellow); *apothecia brown-black, innate*, plane or convex, *immarginate, white internally, bounded beneath with a thin black line;* spores 8, colourless, oblong, simple; paraphyses moderate, lurido-fuscescent at the apices; hypothecium with the middle stratum chalky-white, opake (not hyaline), the lower conceptacular stratum thin black; gelatina hymenea cærulescent with iodine.

On micaceo-schistose maritime rocks, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 473. Crombie En. 66.
GEOG. DISTRIB :—Europe.
BOT. PROV:—7...15.
SCOTLAND :—Portlethen, Kincardine. *Rev. J. M. Crombie.*
WALES :—Dolgelley. *Dr. Holl.*
Distinct from *L. lithophila* and systematically near *L. phæops.* "Spores .009—.017 mm. long, .0035—.0045 mm. broad." (*Nyl.*) T. M. Fries Lich. Scand. 497. considers this to be a form of *L. lithophila.* (Ach.)

140. *L. interludens*, Nyl. *whitish or cinereous-white*, thin, *rimuloso-areolate, areolæ plane, minutely wrinkled*, nigro-limitate, (K pale tawny C—); *apothecia* black, superficial, sessile, rather large, somewhat *plano-convex, immarginate* or *with* a very thin *white thalline margin*, internally colourless; paraphyses slender, distinct, clavate and fuscous at the apices; spores 8, colourless, ellipsoid, simple; gelatina hymenea blue, afterwards the entire thecæ vinous or violet-red.

On calcareous alpine rocks, rare. 1869.

SYN :—Nyl. in Flora 1870. p. 33. Crombie in Seem. Journ. Bot. 8. 98.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Morrone! Braemar. *Rev. J. M. Crombie.* (1869.)
Externally similar to *L. mollis*, which however has the areolæ minutely alboverrucose; and differs from *L. Kochiana*, which has a mouse-coloured thallus and innate apothecia. "Spores .010—12 mm. long, .006—8 mm. broad." (*Nyl.*)

141. *L. nigrificans*, Nyl. *blackish*, opake, thin, *rugulose, areolato-rimose, areolæ flat; apothecia black, plane*, subprominent, marginate, *whitish within*; hypothecium colourless; epithecium greenish-

black; spores 8, colourless, ellipsoid, simple; paraphyses distinct, moderate; gelatina hymenea I vinous-reddish.

On dry argillaceous schistose maritime rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 307.
BOT. PROV :—26.
IRELAND :—South side of Killery Bay, Connemara. *Mr. Larbalestier.* (1876.)
"Spores .011—12 mm. long, .006—7 mm. broad. Belongs probably to the section of *L. confusula*, Nyl. The thallus entirely green within, margin of apothecia sometimes cæsio-suffused." (*Nyl.*)

142. *L. luteo-atra*, Nyl. *dirty-yellowish*, minutely *areolato-diffract*, the dark hypothallus appearing between the areolæ, *areolæ dirty-yellowish, plane, more or less dispersed*, (K— C pale-yellow); *apothecia black, one or two innate in each areola*, plane, immarginate; hypothecium colourless; hymenium pale, paraphyses distinct, cohærent, apices brownish-nigricant; spores 8, colourless, lineari-oblong, simple.

On alpine rocks, rare.

BOT. PROV :—15.
SCOTLAND :—Morrone! Braemar. *Rev. J. M. Crombie.*
Spores .012—.013 mm. long, .0055 mm. broad.

†† *Hypothecium dark.*

143. *L. fusco-atra*, Ach. *fuscous* or *chestnut-coloured* or *fusco-nigricant* or *lurido-cinerascent, areolate, areolæ gibboso-convex* or *plane*, smooth and shining *(K yellow C red)*; apothecia appressed, plane or convex, scattered or confluent, black, naked or sometimes pruinose, margin thin; *hypothecium thick, black; thalamium thin; spores* 8, colourless, ellipsoid, simple, *small.*

"Spores .010—16 long, .005—7 mm. broad." (*Nyl.*) "Spores .010—15 mm. long, .005—7 mm. broad. Spermatia cylindrical, straight, I blue then violet or red." (*T. M. Fries.*) Spores .011—.013 long, .0055—006 mm. broad.

forma *gibba*, Wahl. chestnut-coloured, areolæ *gibboso-convex*, smooth and shining.

On alpine and mountain rocks, not common.

SYN :—Whlnb. Fl. Lapp. 473. (1812.) Ach. Syn. 12.
FIG :—Hffm. Pl. Lich. t. 54. f. 1. a.
EXS :—Leight. 215. 239. Anzi Langob. 280.
GEOG. DISTRIB :—Sweden, Italy.
BOT. PROV :—5...7...15...19...30.
ENGLAND :—Haughmond Hill! Long Mynd! Abdon Burf! Caer Caradoc! Shropshire.
SCOTLAND :—Ben Lawers; Morrone; Craig Tulloch; Hill of Ardo. *Rev. J. M. Crombie.*
IRELAND :—Near Belfast. *Mr. Templeton.* Dunkerron. *Dr. Taylor.* South of Ireland. *Miss Hutchins.*
WALES :—Craig Aderyn! near Towyn.

forma *fumosa*, Ach. *pallido-fuscescent, areolato-diffract, areolæ flat, or slightly concave*, angular, *the edges raised up into a very thin sharp margin*, smooth and shining, (K yellow C red); *apothecia appresso-innate*, plane, scattered or confluent, margined.

On mountain rocks and stones, common.

SYN :—Ach. Syn. 12. (1817.) Nyl. Scand. 230.
EXS :—Leight. 216. 304. Zw. 136. Schær. 470. M. & N. 461. Arn. 191. Anzi Venet. 173.

GEOG. DISTRIB :—Hungary, Switzerland, Bavaria, Italy, Norway.
BOT. PROV :—5, 6, 7...10, 11...15...31.
ENGLAND :—Near Newcastle! Teesdale! *Mr. Robertson.* Craigforda! near Oswestry, Shropshire. *Rev. T. Salwey.* Cliffrig! Ayton Moor! Cleveland. *Mr. Mudd.* Long Mynd! Bodbury Ring! near Church Stretton; Uffington! Haughmond Hill! Shropshire.
SCOTLAND :—Portlethen, Kincardineshire. *Rev. J. M. Crombie.*
WALES :—Corsygedol! near Barmouth. *Rev. T. Salwey.* Capel Curig! *Mr. Borrer.* Moel Siabod! *Mr. Holmes.* Anglesea! *Rev. Hugh Davies.* Pen-maenmawr! Cader Idris! Barmouth! Crib Coch! Snowdon. Glyn! near Capel Curig; Drwsynant! Pen-y-rhiw! Newport Road! Fort Hill! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier.*

forma *Mosigii*, Ach. areolæ pallido-fuscescent, and like those of f. *fumosa*, (K yellow C red), but apothecia *innate*, plane, *cæsio-pruinose.*

On maritime rocks, rare.

SYN :—*L. fumosa var. Mosigii*, Ach. Syn. 12. (1817.) Nyl. Scand. 230.
EXS :—Zw. 137.
GEOG. DISTRIB :—Sweden, Italy.
BOT. PROV :—6, 7...26.
IRELAND :—River Dawros! Doughruagh Mountain! co. Galway. *Mr. Larbalestier.*
WALES :—Barmouth! Builth!

forma *grisella*, Flk. *lurido-cinerascent* or *lurido-whitish*, areolæ plane or rugoso-tumid, (K yellow C red); apothecia appresso-innate, margined, often pruinose.

On mountain rocks, rare.

SYN :—Schær. Enum. 110. (1850.) Nyl. Scand. 230. L. *diacapsis*! Sm. E. Bot.
EXS :—Anzi It. S. 287. Anzi Langob. 110. Schær. 625. Körb. 282. Mudd 182.
GEOG. DISTRIB :—Sweden, Italy, Switzerland, Lombardy, Bavaria, Pyrenees, Madeira.
BOT. PROV :—5...7...9...11...15...26...31.
ENGLAND :—Yew How, Coniston Water, Lancashire. *Mr. Hailstone.* Durham. *Rev. J. Harriman.* Lyth Hill! Middle! Haughmond Hill! Shropshire.
SCOTLAND :—Grampians, Kincardine, *Rev. J. M. Crombie.*
IRELAND :—Lough Feagh! *Mr. Larbalestier.*
WALES :—Trefriw! and Llyn Geirionydd! Cwm Bochlwyd!
CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier.*

forma *meiosporiza*, Nyl. *whitish or albido-cinerascent, rimoso-diffract;* apothecia plane or convex, cæsio-pruinose.

On rocks and boulders, not unfrequent. 1876.

SYN :—Nyl. in Flora 1876, p. 239.
GEOG. DISTRIB :—France.
BOT. PROV :—15...26.
SCOTLAND :—*Rev. J. M. Crombie.*
IRELAND :—Connemara. *Mr. Larbalestier.*

forma *deusta*, Stenh. *fusco-nigricant*, areolato-diffract, (K yellow C red.)

On alpine rocks, rare.

SYN :—Fr. Sched. Crit. 14. 9. (1833.) Nyl. Scand. 229.
EXS :—Fries 405. Leight. 240. Zw. 228.
GEOG. DISTRIB :—Sweden.
BOT. PROV. :—5...7...15.
ENGLAND :—Haughmond Hill! Wrekin Hill! Long Mynd! Shropshire.
SCOTLAND :—Grampians, *Rev. J. M. Crombie.*
WALES :—Moel-y Golfa! Montgomeryshire.

144. *L. lactea*, (Flk.) *yellow-whitish* or *cinerascent*, thin, *smooth*, *rimoso-areolato-diffract*, areolæ plane, (K yellow then deep orange-red); *apothecia black*, numerous, scattered or aggregate, plane, *innate*, *naked* or *pruinose*, *internally-cinerascent*, margin thin, entire or flexuose; *hypothecium dark-nigro-fuscous;* spores 8, colourless, ellipsoid, simple; paraphyses distinct.

On mountain granitic rocks, rare.

SYN :—Flk. in Schær. Spicil. 127. (1812.) Nyl. Scand. 230. *L. ambigua*, Fr. L. S. Exs. 407, Mudd Man. 206.

EXS :—Schær. 176. Zw. 20. Anzi Langob. 157. Leight. 301. Anzi Ital. S. 271. 270. Arn. 470.

GEOG. DISTRIB :—Switzerland, Pyrenees, Sweden, Tyrol.

BOT. PROV :—5...7...10...15...24.

ENGLAND :—Thirsk, Yorkshire. *Mr. Baker*. Mytton Bach! Stiperstones, Shropshire.

SCOTLAND :—Ben Lawers. *Adm. Jones*. Morrone and Glen Dee, Braemar; Falls of Tummell, Blair Athole. *Rev. J. M. Crombie*.

IRELAND :—Limerick. *Adm. Jones*.

WALES :—Capel Curig! *Mr. Borrer*. Barmouth! Glyder Vach! Llanberis ascent of Snowdon! Conway! Pen-maen-mawr! Crib Coch! Snowdon; Llyn Cwlyd! Glyder Vach! Cwm Cywion! Cwm Bochlwyd! Pass of Llanberis! Trefriw! Llyn Geirionydd! Craig Aderyn! Moel Siabod! Cwm Ffynnon Lloer! Cwm Glas!

"Spores .012—15 mm. long, .006 mm. broad. I blue." (*Nyl.*) "Spores .0025 in. long, by .001 in. broad." (*Mudd.*) Spores .01—.0125 mm. long, .0055 mm. broad. The apothecia by excessive confluence appear often as gyrose. The most general colour of the thallus is yellow-whitish or yellowish cream-colour, the grey cinerascent thallus is less frequent, and the cæsio-pruinose state of the apothecia rather rare. The chemical reaction is the confirmatory character in all the states.

145. *L. nitida*, (Schær.) *olivaceo-fuscous*, crustaceous, nigro-limitate, *areolato-diffract*, *areolæ shining*, flat and dispersed in some states, *concave*, *margins upturned*, *whitish and sub-pulverulent*, (K—C—); *hypothallus black*, *often predominatiug; apothecia black*, at first *innate in the areolæ*, *eventually superficial* and sessile, plane, solitary or confluent, margin thin, prominent, entire or flexuose; hypothecium nigro-fuscous; spores 8, colourless, ellipsoid, simple.

On alpine and maritime rocks, not unfrequent. 1856.

SYN :—*L. fumosa var. nitida*, Schær. Enum. 110. (1850.)

FIG :—Hoffm. Pl. L. t. 49. fig. 2. *a. b.* Hepp Sporen t. 15. f. 131.

EXS :—Hepp 131. Anzi Langob. 84. A. 85. Leight. 278. (status hypothallo prædominante).

GEOG. DISTRIB :—Europe.

BOT. PROV :—7...26.

WALES :—Barmouth! (1856.) Glyder Vach! Pass of Llanberis! Snowdon; Cwm Tryfaen! Llyn Cwlyd! Crib Coch, Snowdon! Cwm Ffynnon Lloer! Cwm Ffynnon Llugwy!

IRELAND :—Summit of Doughruagh Mountain! co. Galway. *Mr. Larbalestier*.

Approaching *L. fusco-atra var. deusta* in external appearance but with different reaction.

146. *L. sub-Kochiana*, Nyl. *cinereous*, crustaceous, thin, nigro-limitate, *areolato-diffract*, *areolæ plain*, *(K—C—)*; *apothecia black*, numerous, scattered, *innate*, or *innato-sessile*, *plane*, margin thickish, sometimes slightly paler; *hypothecium thick*, *nigro-fuscous;* spores 8, colourless, ellipsoid, simple, (size of those of *L. fuscoatra.)*

On sub-alpine rocks, not common. 1864.

SYN :—*L. tessellata f. sub-Kochiana*, Nyl. in Flora 1869. p. 85. Scand. p. 227.
GEOG. DISTRIB :—Sweden, Germany, Italy.
BOT. PROV :—7...15...26.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.*
WALES :—Moel-y-Golfa ! Montgomeryshire. (1864.) Pen-maen-Mawr ! Carnarvonshire. Cwm Cywion ! Cwm Bochlwyd !
IRELAND :—Kylemore Castle ! *Mr. Larbalestier.*
Like *L. fusco-atra var. grisella*, but distinguished by different reaction, which also separates it from *L. tessellata*, in which also the areolæ are convex. Spores .012 mm. long, .0065 mm. broad.

147. *L. contiguella*, Nyl. *whitish*, thin, *areolato-rimose, surrounded at the circumference by a black hypothallus*, (K—) ; *apothecia black, adnate*, plane, *margined, concolorous within ; hypothecium brown ;* spores 8, colourless, oblong, simple ; *epithecium dark-bluish ;* paraphyses moderate ; gelatina hymenea I. bluish, then vinous-reddish.

On quartzose boulders, rare. 1872.

SYN :—Nyl. in Flora 1873. p. 289—300.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.* (1872.)
"Differs as above from *L. lactea*, Flk. Spores .011—15 mm. long, .0045—55 mm. broad." (*Nyl.*)

148. *L. scutulata*, Strn. *pale-cervino-rufescent*, thinnish, *areolato-diffract, areolæ plane or somewhat convex*, (K—C—) ; *apothecia fusco-nigricant or black*, rather large, innate, or sometimes slightly emersed and elevate, margin thin ; *hypothecium thick, fuscous-black ; epithecium concave ;* spores 8, colourless, ellipsoid, simple, large ; paraphyses slender, apices fuscescent ; gelatina hymenea I. cœrulescent, then the middle of the hymenium vinoso-fulvescent, the upper portion remaining cærulescent.

On alpine rocks, rare. 1874.

SYN :—Stirton in Grevillea 3. p. 34. (1874.)
SCOTLAND :—Ben Lawers. *Dr. Stirton.* (1874.)
"Closely allied to *L. panæola*, (Ach.), but with different reaction and without the characteristic reddish cephalodia. Spores .024—.032 mm. long, .012—.015 mm. broad." *(Strtn.)*

149. *L. corollidia*, Strtn. *pale or pallido-cinereous*, somewhat thick, *diffracto-areolate*, somewhat *plane*, (K yellow then red) ; *apothecia black, adnate, large*, plane, *rugose, sometimes cæsio-pruinose, margin* obtuse, *flexuose or sinuose ;* spores 8, colourless, ellipsoid, simple ; paraphyses pellucid, indistinct, apices fuscescent ; *hypothecium thick, fuscous-black* ; gelatina hymenea I intense-blue.

On rocks, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 88. (1875.)
BOT. PROV :—17.
SCOTLAND :—Thurso, Caithness. *Dr. Stirton.* (1875).
"Spores .015—.02 mm. long, .008—.011 mm. broad. Beautiful acicular crystals .018—.024 mm. long, .002 mm. broad, are formed by the action of K on the thallus and subhymeneal spaces. At first a clear solution of a yellow colour appears and thereafter stellate groups of these reddish crystals. Perhaps a form of *L. Mooreana.*" *(Strtn.)*

******* *Thallus continuous, rimulose, plane.*

† *Hypothecium pale.*

150. *L. Taylori*, (Salw.) *creamy* or *brownish-white*, tartareous, thickish, effuse, *smooth, rimuloso-diffract*, (K deep yellow C—) ;

*apothecia fusco-rufescent, immersed* or *superficial*, numerous, scattered, *plane* or *plano-convex*, margin thin, entire or immarginate; *hypothecium pale-yellowish-brown, prolonged downwards into the thallus; spores* 8, colourless, *elliptical*, or elongato-elliptical, *large*, simple, *granulate;* paraphyses distinct, somewhat conglutinate, apices fuscescent.

On mountain rocks, not common. 1814.

SYN:—*Biatora Taylori*, Salw. in Trans. Penzance Nat. Hist. Soc. 1853. p. 144. *Lecidea*, Mudd Man. 199. *Bœomyces anomalus*, Tayl. Fl. Hib. 2. 79. *Lecidea lævigata*, Nyl. Enum. 143. Crombie Enum. 65.
FIG:—E. Bot. 2580.
EXS:—Leight. 283. Anzi. Etr. 28. Anzi Venet. 60.
GEOG. DISTRIB:—France, Italy.
BOT. PROV:—1...5, 6, 7...19...26.
ENGLAND:—Ilfracombe. *Miss Attwood.* Torquay. *Dr. Deakin.* Gulval Cairn! Penzance. *Rev. T. Salwey.* Bolt Head, Devon. *Dr. Holl.* Plymouth. *Mr. Holmes.* Spout Valley! Long Mynd near Church Stretton, Craigforda! Shropshire.
IRELAND:—Blackwater co. Kerry. *Dr. Taylor.* Glena and Glen Flesk near Killarney. *Sir T. Gage.* (1814.) near Tully! Dawros river! co. Galway. *Mr. Larbalestier.*
WALES:—Barmouth. *Rev. T. Salwey.* Cwm Bychan. *Mr. Borrer.* Cader Idris! Great Orme's Head! River Gwaine! Goodwick Bay! near Fishguard, Pembrokeshire.
"Spores .0025—.003 in. long, by .001 in. broad." (*Mudd.*) "Spores .018—22 mm. long, .008—.010 mm. broad." (*Nyl.*) Spores .015—.019 mm. long, .0065—.007 mm. broad, frequently filled with sphærical globules or granules. Spermogonia numerous, scattered, brownish, immersed. Spermatia cylindrical, exceedingly slender and delicate, variously curved. Gelatina hymenea I bluish, then fulvescent. Excipulum lateral, brown externally.

151. *L. leiotea*, Nyl. *fuscous* or *griseo-nigricant, thin, varnished, smooth*, determinate, continuous, *obsoletely rimulose; apothecia black*, plane, obtusely margined or margin indistinct, *adnate; hypothecium colourless;* spores 8, colourless, ellipsoideo-oblong, simple; paraphyses moderate, thicker at the fuscescent apices and there generally septato-articulate; gelatina hymenea slightly cærulescent.

On sub-alpine basaltic rocks, rare. 1867.

SYN:—Nyl. in Flora 1867. p. 328. Crombie En. 85.
GEOG. DISTRIB:—Europe.
BOT. PROV:—7...19.
IRELAND:—Crogham! Killarney. *Mr. Carroll.* (1867.)
WALES:—Trefriw falls!
"Spores .008—.011 mm. long, .006—7 mm. broad. Spermatia ellipsoideo-oblong, .004 mm. long, .0015 mm. broad." (*Nyl.*) Spores .012 mm. long, .006 mm. broad. Asci linear, spores in single series.

152. *L. œnea*, (Duf.) *cervino-fuscescent*, somewhat shining, *rimoso-areolate or verrucoso-areolate*, (K yellow C—); *apothecia fuscous-black, adnate*, internally whitish, *often rimulose;* spores 8, colourless, oblongo-ellipsoid, simple; hypothecium colourless; paraphyses cohærent, apices fuscescent or fuliginous.

On quartzose boulders, rare. 1872.

SYN:—Nyl. Prodr. 134. (1857.) Crombie in Journ. Bot. n. s. 2. 135. *Parmelia*, Frs. L. E. 108.
EXS:—Anzi Langob. 111.
GEOG. DISTRIB:—Pyrenees, Sweden, Norway.
BOT. PROV:—15.
SCOTLAND:—Near summit of Morrone, Braemar. *Rev. J. M. Crombie.* (1872.)

"Spores .015—18 mm. long, .005—7 mm. broad. Somewhat like *L. badia.*" (*Nyl.*) "Spores .010—15 mm. long, .005—6 mm. broad. Spermatia long, acicular, curved." (*T. M. Fries.*)

153. *L. semipallens*, Nyl. *dirty-whitish, or albido-glaucous*, thin, *rimulose; apothecia livid or in part pallescent, convex, immarginate*, internally colourless; epithecium and hypothecium colourless; spores 8, colourless, shortly ellipsoid, minute, simple; paraphyses indistinct; gelatina hymenea I vinoso-fulvo-rubescent.

On quartzose rocks, rare. 1876.

SYN:—Nyl. in Flora 1876. p. 234.
BOT. PROV:—26.
IRELAND:—Lough Inagh, Kylemore river, Connemara. *Mr. Larbalestier.* (1876.)
"Spores .006—9 mm. long, .0035—.0045 mm. broad." (*Nyl.*)

154. *L. confusior*, Nyl. *dark-greyish, rimoso-areolate*, indeterminate; *apothecia black, convex, immarginate*, when young plane, obsoletely margined, white within; spores 8, colourless, ellipsoid or oblong, simple; paraphyses thickish, not very well discrete, blackish at the apices; hypothecium colourless; gelatina hymenea I intensely bluish and then vinous-red.

On micaceous rocks, in alpine places. 1874.

SYN:—Nyl. in Flora 1874. pp. 305—318.
BOT. PROV:—15.
SCOTLAND:—Craig Tulloch, Blair Athole. *Rev. J. M. Crombie.* (1874.)
"Allied to *L. confusula*, Nyl. but differing in character of thallus and spores. Spores 0.010—17 mm. long, 0.004—6 mm. broad." (*Nyl.*)

155. *L. restricta*, Strtn. *nigro-cinereous, rugose*, thin; *apothecia black, adnate, small, plane, obtusely margined; spores* 8, colourless, ellipsoid, *binucleate*, simple; thecæ saccate; paraphyses distinct, filiform, thick; epithecium fuscescent, rosy-purple with nitric acid; hypothecium colourless; gelatina hymenea I blue then fulvescent, especially the thecæ.

On rocks, rare. 1875.

SYN:—Stirton in Trans. Glasgow Soc. Nat. p. 88. (1875.)
BOT. PROV:—15.
SCOTLAND:—Blair Athole. *Dr. Stirton.* (1875.)
"Spores .013—.017 mm. long, .008—.01 mm. broad." (*Strtn.*)

156. *L. Breadalbanensis*, Strtn. *black or fuscous-black*, thin, *somewhat rugulose; apothecia black or fuscous-black, small, convex, rugose, immarginate, often conglomerate, internally pale or rather pallido-rufescent; spores* 4—8, colourless, ellipsoid, simple, *with a double epispore;* paraphyses indistinct, conglutinate, apices rufo-fuscescent; hypothecium pale, or in a thin section under a lens rufous; gelatina hymenea I intense-blue.

On mosses and jungermanniæ, rare. 1875.

SYN:—Stirton in Trans. Glasgow Soc. Nat. p. 87. (1875.)
BOT. PROV:—15.
SCOTLAND:—Ben Lawers. *Dr. Stirton.* (1875.)
"Spores .016—.022 (rarely .025) mm. long, .011—.014 mm. broad. Allied to *L. Tornõensis*, Nyl. K reveals the paraphyses as slender, somewhat irregular threads." (*Strtn.*)

157. *L. Henrica*, Larbal. *white*, tartareous, thin, *continuous smooth*, slightly rimulose, (K yellow C yellow); *apothecia pale*

*yellow-carneous*, scattered, *sessile*, somewhat plane, with obtuse or obsolete margin, or *convex*, *subimmarginate*, (K—) ; *hypothecium colourless*, *lateral excipulum pale*, *slightly dusky externally* ; paraphyses distinct, thick, apices colourless ; *spores* 4—6 *or* 8, *colourless*, *oblong* or ellipsoid or fusiformi-ellipsoid, *simple*, *small* ; gelatina hymenea I blue then fulvescent.

On rocks in mountain streams, very rare. 1877.

SYN :—Nyl. in Flora 1877. p. 563.
BOT. PROV :—26.
IRELAND :—Near Kylemore ! co. Galway. *Mr. Larbalestier.* (1877.)
"Spores .015—20 mm. long, .006—7 mm. broad. Spermatia arcuate .018—22 mm. long, .0005 mm. broad." *(Nyl.)* Spores .01—.011 mm. long, .005 mm. broad.

†† *Hypothecium dark.*

158. *L. contigua*, Fr. *greyish-white* or even creamy, tartareous or thin, *contiguous or areolate*, areolæ plane, smooth or rugose, hypothallus black ; *apothecia arising from the thallus*, sessile, *plane* or *convex*, *roughish*, margin thick, prominent and obtuse ; *hypothecium thick*, *blackish-brown* ; *thalamium white* ; spores 8, colourless, oblong, large, simple.

forma *limitata*, Leight. *bluish-grey*, thin, contiguous, smooth, *limited by black hypothallus* ; apothecia moderate, sessile, plane or plano-convex, with pale or blackish-brown pruina.

On rocks, common.

SYN :—*L. contigua*, *a*, *a*. Fries L. Eur. 298. in part (1831.) excl. syn.
EXS :—Leight. 155. Nyl. Pyr. Or. 44.
GEOG. DISTRIB :—Europe, Eastern Pyrenees.
BOT. PROV : -1, 2, 3...5...7...10...18, 19...31.
ENGLAND :—Sussex ! *Mr. Borrer.* Fairlight, Hastings ; Leith Hill ; Monmouth. *Mr. W. Joshua.* Lanbrough-rigg ! Cockshaw near Ayton ! Yorkshire. *Mr. Mudd.* Tors of Dartmoor ; Exeter ; Dartmouth, Devon. *Mr. Parfitt.* Tiptree Heath, Essex. *Mr. Varenne.* Plymouth. *Mr. Holmes.* Abdon Burf ! Haughmond Hill ! Soudley Quarries ! near Hope Bowdler ! Shropshire ; Wapley Hill ! Herefordshire.
SCOTLAND :—Garrynahine, Lewis ; Stennis, Orkney. *Dr. Lindsay.*
IRELAND :—Near Cork ! *Mr. Carroll.*
WALES :—Penmaen-Mawr ! Carnarvonshire ; between Corwen and Bala ! Llyn-y-Cae ! Cader Idris.
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .016—25 long, .008—.012 mm. broad." *(Nyl.)* "Spores .004—.00425 in. long, by .0015—.002 in. broad. Spermatia straight, cylindrical." *(Mudd.)* Spores .022—.0235 mm. long, .011—.012 mm. broad.

forma *platycarpa*, Fr. *greyish-white*, diffuse, thin, at length *evanescent* ; *apothecia very large*, *flat and expanded* ; margin paler.

On rocks, common.

SYN :—Fries L. Eur. 300. (1831.) Nyl. Scand. 224.
FIG :—Massal. Ric. fig. 125. Ach. L. U. t. 2. f. 5.
EXS :—Zw. 18. 424. Nyl. 141. Fellm. 184. 186.
GEOG. DISTRIB :—Germany, Pyrenees, Switzerland, E. Lapland, Italy, Hungary, France, N. Zealand.
BOT. PROV :—5...7...10...15...(19—30)...26.
ENGLAND :—Ludlow. *Mr. Joshua.* Haughmond Hill ! Abdon Burf ! Long Mynd ! Shropshire.
IRELAND :—On Mountains. *Mr. Carroll.* Doughruagh Mountain ! co. Galway. *Mr. Larbalestier*

WALES :—Aberdovey ! *Rev. A. Bloxam.* Pen-y-gwyrd ! Snowdon ; Eglwyseg rocks ! near Llangollen ; Crib Coch ! Nant-Gwynant ! Snowdon ; Barmouth ! Moel-y-Golfa ! Drwsynant ! Aran Mowddy ! Cwm Ffynnon Llugwy ! Geu Craig ! Cader Idris. Moel-y-gest !

"Spores .018—25 mm. long, .008—.012 mm. broad." (*Nyl.*) Spores .016—.024 mm. long, .010—.013 mm. broad.

forma *steriza*, Ach. similar generally to *platycarpa* but with *convex apothecia.*

On rocks, common.

SYN :—Ach. L. U. 174. Nyl. Scand. 224.
EXS :—Anzi It. S. 288. Schær. 628. Nyl. Pyr. Or. 45. Mudd 179.
GEOG. DISTRIB :—Sweden, E. Pyrenees, Italy, Switzerland, Hungary.
BOT. PROV :—7...10...15...26.
ENGLAND :—Ayton ! *Mr. Mudd.*
SCOTLAND :—Amulree ! Perthshire. *Dr. Lindsay.*
IRELAND :—Kylemore ! *Mr. Larbalestier.*
WALES :—Barmouth ! Aran Mowddy ! Eglwyseg rocks !

"Spores .020—22 mm. long, .007—8 mm. broad." *(Nyl.)* Spores .019 mm. long, .0105 mm. broad.

forma *hydrophila*, Fr. *milky* or *cinerascent*, very thin, *smooth*, *continuous* or *rimose* or *dispersed* ; apothecia tumid and convex, naked.

On water-washed rocks, frequent.

SYN :—Fries L. Eur. 301. (1831.)
GEOG. DISTRIB :—Sweden.
BOT. PROV :—7...19...26.
IRELAND :—Near Cork. *Mr. Carroll.* Doughruagh Mountain ! co. Galway ! *Mr. Larbalestier.*
WALES :—Nant Gwynant ! Aran Mowddwy ! Moel-y-gest !
Spores .0195—.025 mm. long, .008—0095 mm. broad.

forma *leprosa*, Leight. *dirty-pale-brown*, *scurfy* or *leprose*, *in round patches*, thin, *minutely verrucose* ; *apothecia* small, *sub-concentric*, *sub-immersed*, plane or convex, margin paler.

On crumbly soft rocks and stones, common.

EXS :—Leight. 156.
GEOG. DISTRIB :—France, Italy.
BOT. PROV :—1, 2, 3...5...8...10...19.
ENGLAND :—Sussex ! *Mr. Borrer.* Penzance ! Cornwall. *Rev. T. Salwey.* Lanbraughrigg ! Guisbro' Moor ! *Mr. Mudd.* Chelmsford ! Essex ! *Mr. Piggott.* Congerstone ! Leicestershire. *Rev. A. Bloxam.* Whitecliff Rocks, Ludlow. *Mr. W. Joshua.* Haughmond Hill ! Steeraway Lime Rocks ! Lyth Hill ! Shropshire.
IRELAND :—Ballinhassig ! Mc Gillicuddy's Rocks ! Kerry ! Musheragh Mount, co. Cork ! *Mr. Carroll.*
Spores .0165—.019 mm. long, .0085 mm. broad.

forma *calcarea*, Fr. *creamy-white*, tartareous, *contiguous*, *smooth* or *rimulose* or *areolate*, *areolæ slightly convex* ; *apothecia* rather small, *appressed*, plane or plano-convex.

On rocks, not unfrequent.

SYN :—Fries L. Eur. 302. (1831.) excl. syn.
EXS :—Anzi Venet. 170. Schær. 471. Anzi It. S. 285. Anzi Langob. 158. Fellm. 183. Maudon 58. Arn. 410.
GEOG. DISTRIB :—Switzerland, Pyrenees, Italy, E. Lapland, Lombardy, Madeira.
BOT. PROV :—7...10...19.
ENGLAND :—Banks of Tees near Middleton. *Mr. Robertson.*
IRELAND :—Ballyoran Wood, Fermoy ! near Cork ! *Mr. Carroll.*
WALES :—Cwm Idwal ! Aran Mowddwy ! Manorbeer ! Cwm Ffynnon Llugwy ! Llyn Aran ! Cwm Clyd ! Cwm Cywion ! Crib Coch ! Cwm Glas !
Spores .02 mm. long, .01 mm. broad.

forma *nobilis*. Fr. ? *pale-ashy-bluish-grey*, very thick and tartareous, *areolate, areolæ turgid and convex; apothecia* large, more or less *convex and hemispherical, slightly pruinose*, margin frequently paler.

On mountain rocks, frequent.

SYN :—Fries L. Eur. 301. (1831.)
EXS :—Mudd 180. Arn. 192. Fellm. 185, Leight. 337.
GEOG. DISTRIB :—Pyrenees, Italy, E. Lapland, Norway.
BOT. PROV :—5...7...10...14.
ENGLAND :—Cliffrigg ! Cleveland. *Mr. Mudd.* Caer Caradoc ! Laurence Hill ! Wrekin ! Pontesford Hill ! Long Mynd and Bodbury Ring ! near Church Stretton ! Shropshire.
SCOTLAND :—Pentland Hills ! *Dr. Greville.*
WALES ;—Aber ! Diganwy ! Carnarvonshire ; Craig Breidden ! Montgomeryshire ; between Llangollen and Corwen ! Moel Siabod ! Snowdon ! Barmouth ! Aran Mowddwy ! Cwm Ffynnon Llugwy ! Cader Idris !
Spores .019 mm. long, .015 mm. broad.

forma *Hoffmanni*, Leight. *dirty-cream-colour*, thick, tartareous, *rimuloso-areolato-diffract, areolæ flattish; apothecia* large, *subinnate* or sessile, flat or convex.

On rocks rare.

SYN :—*Verrucaria contigua*. Hoffm. Fl. Germ. 2. 184. (1798.)
FIG :—Hoffm. Pl. Lich. t. 62.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...7...19.
ENGLAND :—Sussex ! *Mr. Borrer.*
IRELAND :—Musheragh Mount ! co. Cork. *Mr. Carroll.*
WALES : –Cwm Idwal !
Spores .02 mm. long, .011 mm. broad.

forma *flavicunda*, Ach. *rusty-red*, thick, tartareous, *areolate*, areolæ *flat;* apothecia large, appressed, black, flat or plano-convex, more or less albo-pruinose.

On rocks, frequent.

SYN :—Ach. L. U. 166. (1810.) Syn. 22. Nyl. Scand. 224.
FIG :—Mass. Ric. fig. 143.
EXS :—Zw. 16. 17. Schær. 186. Anzi Venet. 174.
GEOG. DISTRIB :—Italy, Pyrenees, Tyrol, Switzerland, Sweden, Finland.
BOT. PROV :—5...7...15...26.
ENGLAND :—Titterstone Clee Hill ! Shropshire. *Rev. T. Salwey.* Brown Clee Hill ! Shropshire.
SCOTLAND :—Loch-na-gar, ! Braemar ; Amulree ! Perthshire. *Dr. Lindsay.*
WALES :—Moel Eilio ! Moel Hebog ! *Mr. Borrer.* Llyn-y-Cae ! Cader Idris ! Barmouth ! very summit of Snowdon ! Moel Siabod ! Penygwryd ! Crib Coch ! Nant Gwynant ! Snowdon. Cwm Tryfaen ! Cwm Bochlwyd ! Cwm Ffynnon lloer ! Llyn Cwlyd !
IRELAND :—Doughruagh Mountain ! co. Galway. Erriff River ! *Mr. Larbalestier.*
"Spores .015—21 mm. long, .008—.011 mm. broad." (*Nyl.*) Spores .0215—.023 mm. long, .0115—.012 mm. broad.

forma *aggerata*, Mudd. *greyish-brown or grey*, effuse, thin, subtartareous, *granuloso-rimoso-areolate; apothecia minute, numerous, aggregated*, convex, immarginate ; hypothecium black ; spores 8, colourless, oblong, simple.

On rocks and walls, rare.

SYN :—Mudd Man. 208. (1861.)
EXS :—Mudd 175.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...7. .10.

ENGLAND :—Lanbraugh-rigg and near Battersby! Cleveland. *Mr. Mudd.* (1861.) Kelvedon, Essex. *Mr. Varenne.*
WALES :– Cwm Glas ! Snowdon.

forma *notabilis.* Nyl. *white or whitish, unequally minutely granulose or nearly leprose, sometimes dispersed, sometimes acervulate* and then with an aspect almost of *Stereocaulon condensatum* ; apothecia somewhat prominent, plane *(trachyloid)*, opake, the margin scarcely distinct.

On rocks, rare.

SYN :—Crombie in Seem. Journ. Bot. 8. 98. Nyl. Scand. 225.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.*
"Spores .018–21 mm. long, .008—.010 mm broad." *(Nyl.)*

forma *umbonata*, Leight. cinerascent, thin, effuse ; *apothecia large* and prominent as in *f. platycarpa*, plane or convex, *centrally umbonate*, margin thin, prominent, flexuose.

On subalpine rocks, frequent. 1854.

BOT. PROV :—5...7.
ENGLAND :—Brown Clee Hill ! Shropshire. (1854.)
WALES :—Aberdovey ! *Rev. A. Bloxam.* Moel Siabod ! Moel-y-Golfa !
Spores .0215 mm. long, .011 mm. broad.

forma *meiospora.* Nyl. *cinerascent*, thin, *areolato-rimulose* ; *apothecia* black, moderate, plane, marginate, *slightly glauco-pruinose* ; hypothecium smaller ; *spores smaller.*

On subalpine rocks, not common. 1870.

SYN :—Nyl. L. Scand. 225.
BOT. PROV :–7...26.
GEOG. DISTRIB :—Finland, Bavaria, Pyrenees, N. Zealand.
IRELAND :—Delphi, Killery Bay, Connemara. *Mr. Larbalestier.*
WALES :—Crib Coch ! Snowdon. (1870.)
"Spores .011—16 mm. long, .006–8 mm. broad." *(Nyl.)* Spores .015—17 mm. long, .001 mm. broad.

forma *pustulata*, Leight. yellowish-grey, areolato-rimulose, nigricanti-limitate, *areolæ plane with a central sorediate protuberance*, some of which are *enlarged into orbicular hemispherical subdepressed tubercules in which* are imbedded a *conglomeration of minute marginate black apothecia.*

On subalpine rocks, rare. 1866.

BOT. PROV :—7.
WALES :—Cader Idris ! (1866.)
Spores .02 mm. long, .01 mm. broad.

159. *L. alumnula*, Nyl. *white*, thin, *in sublobatulate insular patches* (K—) ; *apothecia black, subinnate*, plane, marginate, and *often umbonate* in the centre, internally concolorous ; paraphyses indistinct, apices fusco-nigricant ; *hypothecium and excipulum fusco-nigricant ; spores 8, colourless, ellipsoid, simple.*

Best developed on the thallus of *Lecidea contigua* on rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 574.
BOT. PROV :—26.
IRELAND ;—Near Letterfrack, Connemara. *Mr. Larbalestier.* (1876.)
"Spores .009–.012 mm. long, .005—6 mm. broad. Gelatina hymenea I blue then the thecæ subvinous." (*Nyl.*)

160. *L. tenebrans*, Nyl. *leaden-greyish or dark-leaden-coloured, smoothish, continuous, rimulose* (medulla I partly bluish); *apothecia black, large*, scattered or aggregate, plane or subconvex, margin thin, prominent, eventually obliterated; hypothecium thick, black; spores 8, colourless, ellipsoid, simple, large; gelatina hymenea and thecæ I persistently intense-blue.

On subalpine micaceous schistose rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 309.
BOT. PROV :—26.
IRELAND :—Genevebol! and summit of Doughruagh Mountain (1800 feet) Galway. *Mr. Larbalestier.* (1876.)

161. *L. albo-cœrulescens*, (Wulf.) glaucous or *creamy-white*, opake, *continuous*, smooth, (K— C—); *apothecia* closely *appressed*, plane, *cæsio-pruinose*, margin thinnish, entire, more or less flexuose; hypothecium thickish, dark-brown-black; spores 8, colourless, narrowly oblongo-elliptical, simple, large.

On rocks in mountainous districts, not common.

SYN :—Wulf. ap. Jacq. Coll. 2. 184. (1788.) Ach. Syn. 29. excl. var. *L. contigua var. albo-cœrulescens*, Nyl. Scand. 224.
FIG :—Hoffm. Pl. Lich. t. 14. f. 2.
EXS :—Zw. 129. B. Anzi It. S. 282.
GEOG. DISTRIB :—Germany, Italy, Pyrenees, Hungary, Austria, Switzerland.
BOT. PROV :—1...3...7...10...26.
ENGLAND :—Gardrington, Torbay. *Mr. Parfitt.* Leith Hill, Surrey. *Mr. W. Joshua.* North Bovey, Devon. *Messrs. Jones & Kingston.*
IRELAND :—Kylemore! *Mr. Larbalestier.*
WALES :—Tanybwlch wood, Capel Curig!

Not to be confounded with *L. cyanea*, (Flk.) which is similar in external appearance, but has the apothecia white within and the epithecium when wetted becomes pallido-rufescent. The hypothecium is sometimes interrupted, sometimes continuous and variable in thickness. The size of the spores incline one to consider that it may be a variety of *L. contigua*.

"Spores .022—28 mm. long, .010—12 mm. broad." (*Nyl.*) "Spores .016—25 mm. long, .007—10 mm. broad." (*T. M. Fries.*) Spores .02—.0245 mm. long, .008—9 mm. broad.

Var. *alpina*, Schær. *apothecia* large, *elevated, sessile*, plane or tumid, cæsio-pruinose, *margin thick*, prominent, flexuose; spores as in the type.

On rocks, rare.

SYN :—Schær. Enum. 119. (1850.) Spic. 143. Mudd Man. 211.
EXS :—Zw. 129. A. Schær. 185. Anzi It. S. 283.
GEOG. DISTRIB :—Switzerland, Germany, Italy.
BOT. PROV :—31.
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*

162. *L. confluens*, (Webr.) *dull-smoky-grey*, tartareous, *continuous* or *areolato-rimulose*, smooth or slightly rugulose, effuse or sub-determinate, (K— C—); hypothallus black; *apothecia* numerous, crowded or scattered, large, *confluent, appressed or adnate, margin* thin, slightly prominent, *flexuose*; *disk plane*, in age convex, *of full-opake-black, very smooth, soft* and *velvety; hypothecium dense, nigro-fuscous;* thalamium pale; spores 8, colourless, ellipsoid, simple, small, half the size of those of *L. contigua*.

On mountain rocks, not frequent.

SYN :—Web. Spicil. 180. (1778.) Ach. Syn. 16. pro. p. Nyl. Scand. 225

"Spores .007—9 mm. long, .005—7 mm. broad. Spermogonia commonly ellipsoid, oblong or variously lirellæform, with a narrow nigricant rima. Spermatia bacilliform, straight or slightly curved .007—12 mm. long." (*T. M. Fries.*)
"Spores .009—.015 mm. long, .005—7 mm. broad." (*Nyl.*)

forma *lævigata*, Leight. thallus *smooth*, *continuous*, *rimulose*; *apothecia large*, *appressed*, *almost innate*, simple, *confluent* by juxtaposition, *margin thin*, prominent, entire or flexuose, *paler* than the epithecium.

On mountains or subalpine rocks, not frequent.

FIG :—Web. Spic. t. 2. Hepp. Sporen t. 15. f. 125.
EXS :—M. & N. 463. lower specimen. Schær. 446. Hepp 125. Zw. 131. Anzi It. S. 286.
GEOG. DISTRIB :—Switzerland, Hungary, Pyrenees, Italy.
BOT. PROV :—1, 2, 3...15.
ENGLAND :—Chudleigh Rocks, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Plymouth. *Mr. Holmes.*
SCOTLAND :—Grampians. *Rev. J. M. Crombie.*
Spores .01—.0115 mm. long, .0045 mm. broad.

forma *rimoso-areolata*, Leight. thallus *coarsely-rimoso-areolate*; apothecia and spores as in *f. lævigata*.

On subalpine rocks, not frequent. 1871.

FIG :—Hoffm. Pl. Lich. t. xix. f. 1. (excl. a. b. c. d.)
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—6, 7.
WALES :—Cwm Tryfaen! Cwm Cywion! (1871.) Pen-y-rhiw! near Fishguard, Pembrokeshire.

forma *complicata*, Leight. thallus *minutely rimulose*; *apothecia very large*, adnate, *complicate* or *compound* by *excessive* lateral pressure or *confluence* of many apothecia so as to render the *epithecium reticulate* by the prominent thin margins.

On subalpine rocks, not frequent. 1871.

FIG :—Hoffm. Pl. Lich. t. xix. f. 1. a. b. c.
EXS :—M. & N. 463. upper specimen.
BOT. PROV :—7.
WALES :—Glyder Vach! Cwm Idwal! Cwm Cywion! (1871.)
Spores .0115 mm. long, .0055 mm. broad.

forma *steriza*, Leight. thallus evanescent, apothecia sessile.

On subalpine rocks, not frequent. 1851.

EXS :—Schær. 228.
BOT. PROV :—7.
WALES :—Craig Breidden! Crib Coch! Snowdon. Diganwy! near Conway. (1851.)
Spores .0115 mm. long, .005 mm. broad.

forma *minor*, Hoffm. thallus rimulose; *apothecia half the size of the type*, plane or convex, more or less confluent.

On subalpine rocks, not frequent. 1871.

SYN :—Hoffm. Pl. Lich. vol. 1. 88. (1790.)
FIG :—Hoffm. l. c. t. xix. f. 1. d.
BOT. PROV :—7.
WALES :—Aberdovey! *Rev. A. Bloxam.* Aran Mowddwy! Cwm Bochlwyd! (1871.)
Spores .011—.012 mm. long, .004—5 mm. broad.

forma *oxydata*, Leight. thallus ferrugineo-ochraceous.

On subalpine rocks, rare. 1875.

GEOG. DISTRIB :—Sweden.
BOT. PROV :—26.
IRELAND :—Banks of river Dawros ! co. Galway. *Mr. Larbalestier.* (1875.)

163. *L. sorediza*, Nyl. *cinerascent, smooth, areolato-rimulose*, sprinkled *with small rotundate* plane *sorediæ*, nigricanti-limitate, (K—C—) ; hypothallus nigricant ; *apothecia black*, plane, margined ; epithecium *cæsio-pruinose ;* spores 8, large, colourless, *fusiformi-ellipsoid* ; epithecium fuscescent ; paraphyses moderate or thickish ; hypothecium fuscous-black ; gelatina hymenea I blue, even the thecæ.

On rocks not common.

SYN :—Nyl. Pyr. Or. p. 38. *L. subconfluens*, T. M. Fr. Lich. Scand. p. 487. *L. albocærulescens*, Mudd Man. p. 211.
FIG :—Mass. Ric. p. 140.
EXS :—Mudd 181.
GEOG. DISTRIB :—Sweden, Norway, Finland, E. Pyrenees.
BOT. PROV :—10...26.
ENGLAND :—Lanbraughrigg, ! Cleveland, Yorkshire. *Mr. Mudd.*
IRELAND :—Glencorbot ! near Kylemore. *Mr. Larbalestier.*
"Spores .016—22 mm. long, .007—9 mm. broad ; in Mudd's specimen .016—23 mm. long, .008—9 mm. broad. Like *L. contigua*, but differing in the sorediate thallus, thicker paraphyses, and different reaction with I." (*Nyl.*) "Spores .014—21 mm. long, .006—12 mm. broad." *(T. M. Fries.)* "Spores .0035 in. long, .00125 in. broad." *(Mudd.)* Spores .018 mm. long, .011 mm. broad.

164. *L. consentiens*, Nyl. *whitish*, continuous, moderate, smoothish, *rimoso-diffract*, (K—C—) ; *cephalodia pale ; apothecia black, innato-impressed*, plane, *obtusely margined* ; *hypothecium thin, blackish* ; *spores* 8, colourless, *ellipsoid*, simple, *large* ; paraphyses slender ; epithecium fuscescent ; gelatina hymenea cærulescent then fulvescent with iodine.

On alpine rocks, rare. 1866.

Not unlike some state of *Lecanora cinerea*, (L).
SYN :—Nyl. in Flora 1866. p. 371. Leighton in Ann. and Mag. Nat. Hist. Sep. 1869. Crombie En. 80.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5, 6, 7...15.
ENGLAND :—Spout Valley ! Longmynd near Church Stretton, Shropshire.
SCOTLAND :—Ben Lawers. *Adm. Jones.*
WALES :—Aberdovey ! *Rev. A. Bloxam.* Llyn-y-Cae ! Cader Idris. Aran Mowddwy ! Goodwick Bay ! Pembrokeshire.
"Spores .026—38 mm. long, .015—22 mm. broad." (*T. M. Fries.*) "Spores .027—38 mm. long, .016—22 mm. broad." (*Nyl.*) Spores .025 mm. long, .016 mm. broad.

165. *L. umbonella*, Nyl. *whitish* or *pale-yellow*, thin, determinate, *in orbicular irregular patches, rimoso-diffract*, smooth, (K yellow then red) ; *apothecia black, small, innate*, marginate, generally *subgyrose* or *umbonate* in the centre ; *hypothecium fuscous* or *fuscescent* (the umbo and perithecium fusco-nigricant, as seen in a thin section) ; epithecium nearly colourless ; spores 8, colourless, ellipsoid, simple ; paraphyses moderate ; gelatina hymenea bright-blue with iodine.

On micaceo-schistose alpine rocks, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 372. Crombie En. 85.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...15.

SCOTLAND :—Morrone, Braemar ! *Adm. Jones.* Cairn Turc, Braemar. *Rev. J. M. Crombie.*
WALES :—Twll Dû, Cwm Idwal ! Cwm Ffynnon Lloer !
"Systematically near *L. gyrizans*, Nyl. spermatia cylindrical straight. Spores .011—14 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .014 mm. long, .0055 mm. broad.

166. *L. melaphana*, Nyl. *nigricant*, thin, opake, *diffracto-unequal*; apothecia *black*, smallish, convex, immarginate, *dusky within*; *hypothecium slightly infuscate in lower portion*; *epithecium cærulescent*; spores 8, colourless, oblong, simple; thalamium cærulescent upwards; paraphyses indistinct; gelatina hymenea cærulescent, then partly violet with iodine.

On calcareous mountain rocks, rare. 1869.

SYN :—Nyl. in Flora 1869. p. 83. Crombie En. 84.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.* (1869).
"Naturally near *L. aphanoides*, but distinct by the black thallus, the infuscate hypothecium, &c. approaching *L. paraphana*, Nyl. Spores .011—13 mm. long, .0045—.0055 mm. broad." (*Nyl.*)

167. *L. interjecta*, Nyl. *whitish* or *cinerascent*, unequal, thin, *rimoso-diffract*, indeterminate (C red); *apothecia black*, moderate, plane, margined, *dusky within*; *hypothecium fuscous*; epithecium nearly colourless or slightly lutescenti-fuscescent or dusky; paraphyses slender, not well distinct; spores 8, colourless, ellipsoid, simple; gelatina hymenea cærulescent, then vinous-red with iodine.

On sandstone rocks in sub-alpine places, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 418; Lapp. Or. 177. Crombie En. 81.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Oswestry, Shropshire. *Rev. T. Salwey.* 1866.
"Spores .010—12 mm. long, .006—7 mm. broad." (*Nyl.*)

168. *L. nitescens*, Leight. *white*, thin, *continuous*, *minutely* and irregularly *rimulose*, effuse, indeterminate, (K yellow, C yellow), often overspread, more or less, with a dark-brown alga; *apothecia numerous*, *small*, *planoconvex*, *polished and shining*, *immarginate*; hypothecium very thick, black; paraphyses distinct, but conglutinate, apices pale; spores 8, colourless, oblong or lineari-oblong, simple, moderate in size; gelatina hymenea I. fulvescent.

On rocks. 1875.

SYN :—Leight. in Grevillea 4. 79. (1875).
BOT. PROV :—26.
IRELAND :—Salrock Road ! Connemara. *Mr. Larbalestier.* (1875).
Spores .017 mm. long, .0055 mm. broad.

169. *L. subumbonata*, Nyl. *white*, subopake, thin, *unequal*, (K—C—); *apothecia black*, *opake*, somewhat plane, *umbonate in the centre*, margined, internally concolorous; hypothecium thick, nigro-fuscous; spores 8, colourless, oblongo-ellipsoid, simple; paraphyses distinct, apices fuscous; gelatina hymenea I blue, afterwards the thecæ vinoso-fulvo-rubescent.

On micaceo-schistose rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 236.
BOT. PROV :—26.

IRELAND :—Near Letterfrack ! Connemara. *Mr. Larbalestier.* (1876).
"Belongs to the section of *L. jurana*, Schær. Spores .016—22 mm. long, .007—9 mm. broad. Spermatia cylindrical or obsoletely fusiformi-cylindrical .004—7 mm. long, .0008 mm. broad." (*Nyl.*) Spores .0175 mm. long, .009 mm broad.

170. *L. contortula*, Stirt. *pale-cinerascent, or somewhat plumbeo-cinerascent*, thickish, rugosulose, *rimoso-areolate*, (K—C—); *apothecia black, adnate, rather large*, plane or somewhat convex, *with a thick margin, umbonate or gyroso-plicate; hypothecium fuscous-black*, fuscous upwards; paraphyses moderate, distinct, fusco-apiculate; *spores 8, colourless, oblong or fusiformi-oblong, simple.*

On rocks, rare. 1876.

SYN :—Stirton in Scottish Naturalist 4. 167. (1877).
BOT. PROV :—16.
SCOTLAND :—Near Salen, in Mull. *Dr. Stirton.* (1876).
"Nearly allied, if not identical with *L. subumbonata*, Nyl. Flora 1876. p. 236. Spores .015—.021 mm. long, .006—.0075 mm. broad. Gelatina hymenea I blue then vinous-red, especially the asci." *(Stirt.)*

171. *L. spodoplaca*, Nyl. *cinereous* or *ochraceous-brown* or *leaden-ochraceous*, thin, smooth, *rimulose or rimoso-diffract*; *apothecia black*, plane, *prominent, margined*, concolorous within; *epithecium and hypothecium brown*; spores 8, colourless, oblong, simple; paraphyses indistinct; gelatina hymenea I bluish, then vinous-red.

On siliceous rocks in a stream with *L. lacustris*, very rare. 1876.

SYN :—Nyl. in Flora 1877. p. 567. *L. baliola*, Nyl. in Flora 1876. p. 308.
BOT. PROV :—26.
IRELAND :—Killery Bay, and Kylemore Lake, Connemara, Galway. *Mr. Larbalestier.*
"Spores .008—9 mm. long, .002—3 mm. broad." (*Nyl.*)

172. *L. indigula*, Nyl. *white, thin, continuous, rugulose*, (K—C—); *apothecia nigricant*, somewhat prominent, plane, margined, internally concolorous; hypothecium thick, nigro-fuscous, excipulum thin, colourless; paraphyses slender, distinct, apices colourless; *spores* 8, *colourless, ellipsoid or oblong, simple.*

On micaceo-schistose stone walls; very rare. 1877.

SYN :—Nyl. in Flora 1877. p. 563.
BOT. PROV:—26.
IRELAND :—Glencorbot ! Galway. *Mr. Larbalestier.* (1877).
I describe the hypothecium as I saw it in the only specimen, but Nylander l. c. says "hypothecium rufescens parte supera subhymeniali crassé nigrescente. Gelatina hymenea I pale-blue then vinous-red. Spores .013—16 mm. long, .006—7 mm. broad." (*Nyl.*) Spores .017 mm. long, .008 mm. broad.

******** *Thallus evanescent.*

† *Hypothecium pale.*

173. *L. mutabilis*, Fee. *evanescent*; *apothecia rufo-fuscescent*, small, scattered, sessile, plane, margin thin, entire; *hypothecium colourless*; spores 8, colourless, *rotundo-oblong*, simple, large.

On trees, Myrica Gale, rare. 1851.

SYN :—Fée Suppl. 105. (1837). Crombie Enum. 120. Mudd Man. 195.
FIG :—Fée Suppl. t. 42. f. 16.
GEOG. DISTRIB :—Central America, Mexico, Europe.
BOT. PROV :—19...24...26...31.
IRELAND :—Glencar, Kerry! Mount Shannon, Limerick; Lough Cooter, Galway; Killaloe, Clare, Blackwater Bridge, and Old Dromore, Kerry; Castlebernard Park, Bandon; Mangerton. *Mr. Carroll.*
CHANNEL ISLANDS :—Rosel, Jersey! *Mr. Larbalestier.* (1851).
WALES :—Llyn Gwernan!
"Spores .003—.004 in. long by .002 in. broad. Spermatia acicular, more or less curved." (*Mudd.*) Spores .0145—.016 mm. long, .01—.011 mm. broad. Gelatina hymenea I blue.

174. *L. gelatinosa*, (Flk.) *æruginose, leproso-gelatinous, evanescent; apothecia black, appressed, plane, immarginate*, scattered, moderate, *pale-brown within; hypothecium* concolorous with the hymenium, lutescent; spores 8, colourless, ellipsoid, simple; *paraphyses indistinct*; gelatina hymenea not coloured by iodine.

On earth in sub-alpine places, not common.

SYN :—Florke in Berl. Mag. 1809. p. 201. Schær. Enum. 137. Ach. Syn. 26. Nyl. Prod. 110. Mudd Man. 196.
FIG :—Hepp Sporen t. 57. f. 493.
EXS :—Schær. 205. Hepp 493. Zw. 82. M. & N. 843. Leight. 353.
GEOG. DISTRIB :—Switzerland, Germany, France.
BOT. PROV :—2...5...10...19...23...26...30.
ENGLAND :—Cliffrigg! Guisbro' Moor! Yorkshire. *Mr. Mudd.* Blexhill! *Mr. Roper.* Stiperstones Hill! Shropshire.
IRELAND :—Kelley's Glen and near Dublin; Slemish Mountain co. Antrim. *Dr. Moore.* near Bantry. *Miss Hutchins.* Lough Muck! Lough Feagh! *Mr. Larbalestier.*
"Spores .0025 in. long by .001 in. broad." (*Mudd.*) "Spores .012—17 mm. long, .0045—.006 mm. broad." (*Nyl.*) "Spores .007—9 mm. long, .004—5 mm. broad." (*T. M. Fries.*) Spores .014—.0145 mm. long, .005—7 mm. broad.

175. *L. perobscura*, Nyl. *black*, subopake, *thin*, or very th in, *effuse; apothecia concolorous*, or *brownish-black*, slightly *convex, immarginate, greyish within*; spores 8, colourless, ellipsoid, small; paraphyses not discrete; epithecium brownish-inspersed; hypothecium colourless; gelatina hymenea I bluish.

On old fir pales, rare. 1873.

SYN :—Nyl. in Flora 1874. p. 9.
BOT. PROV :—15.
SCOTLAND :—Near Killin. *Rev. J. M. Crombie.* (1873.)
"Allied to *L. uliginosa*, but sufficiently separated by the above characters. Spores .006—8 mm. long, .0035 mm. broad." (*Nyl.*)

176. *L. subvernalis*, Strn. *white, hypophlœodal*, very thin; *apothecia pale-yellow, then bluish-black, ultimately fusco-nigricant*, small and convex, *pellucid within*; hypothecium colourless; spores 8, colourless, oblong, simple, moderate; paraphyses conglutinate; gelatina hymenea I cærulescent, then violet or vinoso-violet.

On old putrid woods, rare. 1874.

SYN :—Stirton in Grevillea 3. p. 33. (1874.)
BOT. PROV :—15.
SCOTLAND :—Near Grantown, Inverness. *Dr. Stirton.* (1874.)
"Spores .012—.02 mm. long, .0055—.006 mm. broad." (*Strtn.*)

177. *L. arridens*, Nyl. *white*, very thin, plane, effuse, *dispersed and evanescent, (K—C—)*; *apothecia bright-fleshy-rose-colour*, plane, immarginate, often with a white irregular spurious thalline margin;

*hypothecium colourless;* hymenium colourless, I dirty-lutescent; paraphyses distinct, apices colourless; spores 8, colourless, ellipsoid, simple.

On stones, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 573.
BOT. PROV :—26.
IRELAND :—Delphi! Connemara. *Mr. Larbalestier.* (1876.)
"Somewhat generally similar in character to *L. coarctata.* Spores .014—18 mm. long, .007—.010 mm. broad. Iodo gelatina hymenialis vinose fulvo-rubescens." (*Nyl.*) Spores .019 mm. long, .009 mm. broad.

178. *L. grumosa,* Leight. *evanescent; apothecia rufo-fuscescent, minute,* scattered, *adnato-sessile, plano-convex,* the slight margin soon obliterated; *hypothecium colourless; hymenium yellow, grumous; paraphyses altogether indistinct,* apices colourless; *spores* 8, in lineari-obovate asci, *colourless,* oblong, *simple, filled with very minute spherical granules.*

On pine bark, rare. 1877.

SYN :—Leight. in Linn. Trans. 2d. ser. 1. 242.
FIG :—Linn. Trans. l. c. t. 33. f. 7. 8. 9.
BOT. PROV :—26.
IRELAND :—Ballinahinch! Glendalough! Galway. *Mr. Larbalestier.* (1877.)
A very singular species. Gelatina hymenea I blue, then fulvescent. Spores .013—.015 mm. long, .007—.009 mm. broad.

179. *L. antiloga,* Stirt. nearly *evanescent; apothecia black, minute, adnate,* plane, *margin somewhat shining, internally obscure especially upwards;* hypothecium colourless; paraphyses very indistinct, apices nigricant or virescenti-nigricant; spores 8, colourless, spherical, simple.

On decorticated wood, rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. p. 164. (1877.)
BOT. PROV :—15.
SCOTLAND :—Aviemore, Elgin. *Dr. Stirton.* (1877.)
"Gelatina hymenea I blue then dark-violet. Spores .004—.0055 mm. broad." *(Stirt.)*

†† *Hypothecium dark.*

180. *L. diducens,* Nyl. *evanescent; apothecia aggregate,* black, moderate, plane, margin *elevated, flexuose, lobate, dark within; hypothecium fuscous,* lateral excipulum horny and black; spores 8, colourless, ellipsoid or oblong, small, simple; paraphyses thick, distinct, with black clavate apices; gelatina hymenea cærulescent with iodine.

On felspathic rocks, rare.

SYN :—Nyl. in Flora 1865. p. 148. Crombie Enum. 85.
EXS :—Larbal. 39.
GEOG. DISTRIB :—Europe.
BOT. PROV :— 26..31.
IRELAND :—Dawros Bridge! co. Galway. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Noirmont! Le Fret Common! Jersey. *Mr. Larbalestier.*
Spores .008—9 mm. long, .0035—.0045 mm. broad. *(Nyl.)* Spores .008—9 mm. long, .004 mm. broad.

181. *L. obsoleta,* Nyl. *evanescent;* apothecia black, *minute,* opake, *margin obtuse* or indistinct, *concolorous within; hypothecium*

*darkly-fuscescent; epithecium diluto-nigrescent;* spores 8, colourless, oblong, simple or with an obsolete septum; paraphyses moderate, distinct, apices sub-clavato-incrassate, nearly colourless; gelatina hymenea scarcely tinged with iodine.

On chalky earth, rare. 1865.

SYN:—Nyl. in Flora 1865. p. 604. Crombie En. 92.
GEOG. DISTRIB:—Europe.
BOT. PROV:—2.
ENGLAND:—Near Lewes on the Sussex Downs. *Adm. Jones.* (1865.)
Systematically near *L. neglecta*, Nyl. Spores .009—.011 mm. long, .003 mm. broad. (*Nyl.*)

182. *L. jurana*, Schær. *white, tartareo-farinose, unequally disperso-granulose* or *evanescent; apothecia superficial, sessile, scattered* or *aggregate, black*, at first concave, then plane, *margin thick*, prominent, *flexuose, internally black; hypothecium and epithecium black; thalamium hyaline;* spores 8, colourless, ellipsoid, simple; paraphyses distinct; gelatina hymenea blue with iodine.

On calcareous rocks, not common. 1869.

SYN:—Schær. Enum. 123. (1850.) Nyl. Prodr. 125.
EXS:—Anzi Langob. 356. Arn. 10. Zw. 239. Korb. 253.
GEOG. DISTRIB:—Lombardy, Hungary, Germany, Sweden, Norway, Pyrenees.
BOT. PROV:—5, 6, 7...15.
ENGLAND:—Llanymynech Hill! Shropshire.
SCOTLAND:—Castleton of Braemar. *Rev. J. M. Crombie.*
WALES:—Llyn Aran! Llyn-y-Cae! Cader Idris. (1869.) Crib Coch! Snowdon. Cwm Cywion! Cwm Idwal! Tanybwlch wood, Capel Curig! Aran Mowddwy! North Cliff, Tenby! Barmouth!
Possibly only a variety of *L. contigua.* "Spores .016—18 mm. long, .010—11 mm. broad." (*Nyl.*) "Spores .012—16 mm. long, .007—8 mm. broad." (*T. M. Fries.*) Spores .017 mm. long, .008—9 mm. broad.

183. *L. fusco-rubens*, Nyl. *cinerascent, very thin, effuse, granuloso-unequal or evanescent; hypothallus fuscous; apothecia* not very numerous, scattered, sessile, *fuscous-black, plano-convex, immarginate, internally fuscous; hypothecium thick, fuscous;* epithecium pallido-rufescent; spores 8, colourless, ellipsoid or globoso-ellipsoid, simple.

On alpine rocks, rare.

SYN:—Nyl. Animad. Scand. in Bot. Notis. 183. (1853.) Prodr. 106. Scand. 199.
GEOG. DISTRIB:—Sweden, Norway, Europe, Canaries.
BOT. PROV:—15.
SCOTLAND:—Ben Lawers; Craig Guie; Craig Tulloch. *Rev. J. M. Crombie.*
"Near *L. sanguineo-atra*, Ach. Spores .010—14 mm. long, .007—9 mm. broad." (*Nyl.*)

184. *L. calcivora*, (Ehrh.) *greyish-white* or white, *thin, effuse, evanescent; apothecia* small, scattered, *calcivorous, foveolato-immersed* in the rock, black, cæsio-pruinose or naked, internally cinerascent in the middle; margin thin, evanescent; hypothecium fuscescent below; spores 8, colourless, elliptico-oblong, simple, granulate; paraphyses indistinct; gelatina hymenea blue then vinous-red with iodine.

On calcareous rocks, frequent. 1794.

SYN :—Ehrh. Cr. Exs. 244. (1793.) Nyl. Prodr. 135. *L. immersa*, (Schrad.) Ach. Meth. 34.
FIG :—E. Bot. 193. Leight. Ang. Lich. t. 24. f. 5. Mudd Man. 203.
EXS :—Nyl. 138. Schær. 201. Anzi It. S. 266. 267. Leight. 94. Arn. 360. b.
GEOG. DISTRIB :—France, Switzerland, Europe.
BOT. PROV :—1...3...6, 7, 8...10, 11...(19—30).
ENGLAND :—Derbyshire. *Sir J. E. Smith.* (1794.) Ingleborough. *Dr. Carrington.* near Thirsk. *Mr. Baker.* near Masham, Yorkshire. *Mr. Mudd.* Durham and Northumberland. *Mr. Winch.* Ingsdon ; Chudleigh ; Bickington ; Ashburton ; Babbicombe, Devon. *Messrs. Jones & Kingston.* Charlton, Kent. *Mr. Holmes.* Craig-y-Rhiw ! near Oswestry ; Llanymynech Hill ! Shropshire.
IRELAND :—Not uncommon. *Mr. Carroll.*
WALES :—Eglwyseg rocks ! near Llangollen ; Great Orme's Head ! Tenby !
Externally and generally similar to, but not to be confounded with *Verrucaria immersa*, Leight. Ang. Lich. t. 25. f. 2. "Spores .003—.00325 in. long, by .001—.00125 in. broad." (*Mudd.*) "Spores .013—18 mm. long, .008—9 mm. broad." (*Nyl.*) "Spores .010—15 mm. long, .007—8 mm. broad." (*T. M. Fries.*) Spores .011—.012 mm. long, .007 mm. broad. The apothecia, when wetted, remain of a black colour by reason of the dark hypothecium and so prevents its confusion with *Lecidea Metzleri*, (*Körb.*) and *Lecanora Agardhanoides*, *Mass.* in which the disk of the apothecia, when wetted, becomes of a translucent chestnut-brown by reason of the pale hypothecium.

185. *L. Metzleri*, (Körb.) *greyish-white*, thin, effuse, evanescent ; *apothecia* black, *innato-adnate*, plane, slightly margined, at length convex, immarginate ; *epithecium when wetted translucent chestnut-brown, the margin darker-brown* ; *hypothecium colourless* ; *spores* 8, colourless, broadly oblong, simple, *large* ; paraphyses distinct, conglutinate, apices fuscous ; gelatina hymenea I blue then fulvescent, thecæ reddish.

On calcareous rocks, rare. 1872.

SYN :—Korber Par. 162. (1865.) T. M. Fr. Scand. 478.
EXS :—Arn. 351.
GEOG. DISTRIB :—Germany, Sweden, Norway.
BOT. PROV :—6.
WALES :—Giltar Point ! Tenby. (1872.)
"Spores .016—26 mm. long, .006—10 mm. broad." (*T. M. Fries.*) Spores .02 mm. long, .0115 mm. broad.

186. *L. enclitica*, Nyl. thallus nearly evanescent ; *apothecia* black, *minute*, convex, immarginate, *dispersed*, *internally obscure;* epithecium nigrescent ; paraphyses indistinct ; *hypothecium fuscous;* spores 8, colourless, oblong, simple ; gelatina hymenea cærulescent, then dusky-vinous with iodine.

On old fir pales in sub-alpine localities, rare. 1870.

SYN :—Nyl. Lapp. Or. 148 (1866.) Crombie in Seem. Journ. 9. 178.
EXS :—Arn. 408.
GEOG. DISTRIB :—E. Lapland.
BOT. PROV :—15.
SCOTLAND :— Pass of Killiecrankie in Blair Athole. *Rev. J. M. Crombie.*
"Spores .008—.015 mm. long, .003—4 mm. broad." (*Nyl.*) "Spermogonia papillæform ; spermatia shortly cylindrical, slightly curved somewhat at each apex .0030—35 mm. long." (*T. M. Fries.*)

187. *L. deparcula*, Nyl. *greyish*, thin, *sub-areolate*, *dispersed*, evanescent, hypothallus black, but little conspicuous ; *apothecia black*, small, somewhat *difformed*, slightly prominent, *subumbonate*, in the centre, *concolorous within*, *margin obtusely turgid and sometimes subcrenate ;* hypothecium brownish-black ; spores 8, colour-

less, ellipsoid, simple; epithecium obscurely-bluish; paraphyses moderate, bluish-green towards the apices; gelatina hymenea intensely-blue or dark-blue with iodine.

On calcareous stones. 1871.

SYN :—Nylander in Flora 1872. p. 361.
BOT. PROV :—15.
SCOTLAND :—Summits of Ben-y-gloe and Cairn Gowar. *Rev. J. M. Crombie.* (1871.)
"Spores .009—12 mm. long, .005—7 mm. broad." *(Nyl.)*

188. *L. confœderans*, Nyl. thallus scarcely any visible; *apothecia black*, plane, obtusely margined, *verrucoso-congested*, (verrucæ composed of 20—30 or more apothecia), *blackish within*; *hypothecium thick*, brownish-black, (K purplish); *spores* 8, colourless, *lineari-oblong*, simple, *minute*; paraphyses moderate or thickish, clavato-incrassate and bluish-black or greenish-black at the apices.

On quartzose boulders in alpine regions, rare. 1872.

SYN :—Nyl. in Flora 1873. p. 289—300.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar! *Rev. J. M. Crombie.* (1872.)
"A very distinct species. Spores .010—11 mm. long, .003—4 mm. broad." (*Nyl.*) Spores .0105 mm. long, .003 mm. broad. The structure of the apothecium is very peculiar. The very thin narrow hymenium of a pale-bluish colour, surmounted with a thickish violet-black epithecium, rests on a thick nigrofuscous hypothecium, beneath which is a pale colourless stratum, and the whole included in a violet-black thickish excipulum.

189. *L. phylliscocarpa*, Nyl. *brown*, very thin or evanescent; *apothecia black, phylliscoid i.e. umbilicately affixed, rosulato-compound, rotundato-difformed*, large, above with the margins thin, *subradiately and irregularly disposed, slightly costate* and at the circumference *sub-crenato-effigurate, within blackish*, the hymeneal stratum whitish; spores 8, colourless, ellipsoid or oblong, simple; epithecium bluish-blackish; paraphyses thickish, bluish-black at the clavate apices; hypothecium sordidly dark; gelatina hymenea I intensely-bluish.

On quartzose stones in alpine places, rare. 1874.

SYN :—Nyl. in Flora 1874. p. 314.
BOT. PROV :—15.
SCOTLAND :—Summit of Morrone, Braemar. *Rev. J. M. Crombie.* (1874.)
"Spores 0.009—0.011 mm. long, 0.0035—0.0045 mm. broad." (*Nyl.*)

190. *L. sarcogyniza*, Nyl. greyish, thin, indeterminate, opake, evanescent; apothecia black, plane, margin often flexuose, dusky within; hypothecium sub-hymeniale distinctly fuscescent, its middle stratum nearly colourless, lower stratum nigricant or black; epithecium black; spores 8, colourless, oblong, simple; *thalamium colourless*; paraphyses moderate, distinct but cohærent, nigricanti-clavate at the apex; gelatina hymenea intensely-blue with I.

On mountain and maritime granitic rocks, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 475. Crombie En. 82.
EXS :—Zw. 22. Schær. 187.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—15.
SCOTLAND :—Morrone; near Nigg, Kincardine; Cairn Gowar; Hill of Ardo. *Rev. J. M. Crombie.* (1868.)

"Approaching *L. sarcogynoides*, Krbr. but differs in the colourless thalamium and other characters. Spores .007—.011 mm. long, .003 mm. broad." (*Nyl.*) Spores .0065—.009 mm. long, .003 mm. broad.

191. *L. sarcogynoides*, Kbr. evanescent; *apothecia black, crowded and aggregate*, closely adnate, *difformi-angulate by close juxta position*, plane, margin thick, prominent, flexuose; *hymenium narrow, bluish-grey;* paraphyses thick, indistinct, conglutinate, apices nigricant; *hypothecium very thick, nigro-fuscous; spores* 8, colourless, *lineari-ellipsoid*, simple, *minute*.

On granitic maritime rocks, rare.

SYN:—Korber S. L. G. 252. (1855.) Par. 224.
EXS:—Korb. 47.
GEOG. DISTRIB:—Germany.
BOT. PROV:—31.
CHANNEL ISLANDS:—La Moye, Jersey. *Mr. Larbalestier.*

192. *L. tephrizans*, Leight. *thallus* nearly *obliterated*, only a few whitish depressed scattered areolæ, (K—C—); *hypothallus predominating, cinerascent; apothecia black*, numerous, plane, or slightly concave, prominent, sessile, moderate, margin thickish, eventually obliterated; *hypothecium nigrofuscous, subtended by pale-greyish-blue hyaline excipulum; hymenium thin, pale-greyish-blue;* paraphyses distinct, but cohærent, apices nigrofuscous; *spores* 8, *colourless, narrowly ellipsoid, simple, minute*.

On hard slaty rocks, rare. 1876.

SYN:—Linn. Trans. 2d. ser. vol. 1. p. 237.
FIG:—Linn. Trans. l. c. tab. 32. f. 3, & 4.
BOT. PROV:—6...26.
IRELAND:—Kylemore! *Mr. Larbalestier.*
WALES:—Llanachar Bridge! near Fishguard, Pembrokeshire. (1876.)
Spores .009—.01 mm. long, .004—.005 mm. broad. Spermatia minute shortly cylindrical, straight. Gelatina hymenea I dirty-blue.

B. *Spores polari-bilocular.*

193. *L. polospora*, Leight. *white or albo-glaucous*, very thin and filmy, effuse, smooth and somewhat shining, unequal or rugulose, (K—C—); *apothecia black, minute*, scattered, *adnate*, plane, with a narrow slightly prominent margin, at length plano-convex and immarginate; *hypothecium nigro-fuscous;* hymenium colourless; paraphyses distinct, thickish, apices globular, nigro-fuscous; *spores* 8, *fuscous, elliptical, with a paler-fuscous roundish cell at each apex.*

On old hawthorns, very rare. 1877.

SYN:—Leight. in Linn. Trans. 2d. ser. 1. p. 241.
FIG:—Linn. Trans. l. c. t. 33. f. 4. 5. 6.
IRELAND:—Ballinahinch Churchyard! co. Galway. *Mr. Larbalestier.* (1877.)
Much resembling in general aspect *Lecidea myriocarpa*, D.C. Gelatina hymenea I deep blue. Spores .02—.022 mm. long, .009 mm. broad. The peculiar shape and structure of the spores keep it an entirely distinct species.

C. *Spores 1-septate, brown.*

* *Hypothecium dark.*

194. *L. canescens*, (Dicks.) *white* or *albo-glaucescent*, sub-tartareous, *orbicular, adnate, radiato-plicate, sorediate, circumference truncato-*or *repando-lobate*, surface generally smooth, minutely

albo-granuloso-pruinose, (K yellow C—); hypothecium black; apothecia rare, small, black, plane, depressed, central, crowded, cæsio-pruinose, margin paler, entire, flexuose; spores 8, fuscous or fusco-nigricant, elliptico-oblong, 1-septate or bilocular and nucleolate.

On old trees, oak, sycamore, lime, ivy, walls and rocks, frequent but rare in fruit. 1785.

SYN:—Dicks. Crypt. 1. 10. (1715.) Ach. Syn. 54. Nyl. Prodr. 119. Mudd Man. 169.
FIG:—Dicks. Crypt. 1. t. 2. f. 5. E. Bot. 582. Hepp Sporen t. 61. f. 527. 528.
EXS:—Hepp 527. 528. Schær. 576. Welw. Lusit. 54. Nyl. 137. Larbal. 33. Bohl. 68. M. & N. 1152. Anzi It. Sup. 290.
GEOG. DISTRIB:—Normandy, Germany, Switzerland, Portugal, France, Italy, Africa, E. Indies.
BOT. PROV:—1, 2, 3, 4, 5...7...10, 11...15...19...24, 25...30, 31.
ENGLAND:—Middleton! near Oswestry, Shropshire. *Rev. T. Salwey.* near St. German's, Cornwall; Isle of Wight! Battenhall! Worcester. *Dr. Holl.* Essex. *Mr. Pigott.* near Ayton! Cleveland. *Mr. Mudd.* Gainford and Houghton-le-Spring, Durham; near Hexham, and Brinkburn Priory, Northumberland. *Mr. Winch.* Chudleigh; Exeter, Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* Cheam; Hendon; Tunbridge Wells. *Rev. J. M. Crombie.* Plymouth. *Mr. Holmes.* Southrop; near Cheltenham. *Mr. W. Joshua.* Wheatfield Park! Oxfordshire. *Mr. Larbalestier.* Broome Park near Hythe, Kent. *Mr. Holmes.* Sutton! near Shrewsbury; Tong Church! Uriconium! Salop.
SCOTLAND:—Appin; Castleton. *Rev. J. M. Crombie.*
IRELAND:—Near Belfast. *Mr. Templeton.* Rathrouan, Clonmel. *Mr. Gough.* co. Wicklow. *Mr. Moore.* Robert's Cave, Cork; Carrigogummel, Limerick, and Dromoland, Clare. *Mr. Carroll.*
WALES:—Barmouth and Dolgelley. *Mr. Holmes.* Llanbedrog! Harlech Castle!
CHANNEL ISLANDS:—Fliquet Bay! Jersey; Guernsey; Sark. *Mr. Larbalestier.*
"Spermogonia rare, black, punctiform, slightly prominent. Spermatia rather large, straight, cylindrical .00175 in. long, by .0002 in. broad. Spores .0025—.003 in. long, by .001—.00125 in. broad." (*Mudd.*) "Spores .011—14 mm. long, .006—7 mm. broad. I intense-blue." (*T. M. Fries.*) Spores .0115—.0135 mm. long, .007 mm. broad.

195. *L. insignis*, (Næg.) *sulphury-whitish*, tartareous, *verruco-granulose or subleprose;* (K yellow C orange or orange-red); *apothecia rather large, adnate*, often confluent, very black, opake, plane, obtusely margined, at length convex; *hymenium fuscous upwards;* paraphyses lax; hypothecium fuscous; spores 8, fuscous, rather large, oblong, 1-septate, constricted in the middle.

forma *corticicola*, Kbr.

SYN:—Kbr. Syst. 230. (1855.) Grevillea 1. 134.
EXS:—Hepp 39. Anzi Ital. Sup. 297.
GEOG. DISTRIB:—Germany, Switzerland, Italy.
BOT. PROV:—5.
ENGLAND:—Bomere Pool, Shropshire! (1871.)
Spores .0175 mm. long, .0065 mm. broad. I violet.

196. *L. saxorum*, (Mass.) *dirty-yellowish-white*, thin, minutely *areolato-rimulose, plane*, nigro-limitate, *(K yellow C orange-red)*; apothecia numerous, scattered, sessile, plane, black, margin thick, entire, rather paler; *hypothecium black*, or *nigro-fuscous*; spores 8, fuscous, oblong, 1-septate, somewhat curved, nucleolate.

On rocks, not common. 1870.

Not to be confounded with *L. disciformis*, which has a different chemical reaction, larger spores, and other characteristics.

SYN :—*Buellia saxorum*, Mass! Ric. 82. (1852.) *Buellia leptocline*, Mass. Geneac. 20. *Lecidea disciformis*, Fr. Nyl! Scand. 236. (in part).

FIG :—Mass. Ric. fig. 169. Hepp Sporen t. 86. f. 752.

EXS :—Nyl. L. P. 60. Larbal. 35. Mass. 347. Hepp 752. Anzi Etr. 31.

GEOG. DISTRIB :—Italy, France, Pyrenees.

BOT. PROV :—10...31.

ENGLAND :—Farndale! Yorkshire. *Mr. Mudd.*

CHANNEL ISLANDS:—Noirmont! Jersey. *Mr. Larbalestier.*

Spores .0135—.015 mm. long, .006—.008 mm. broad.

197. *L. saxatilis*, (Schær.) *white* or *whitish*, moderately thick, tartareous, *rugoso-unequal*, (K faint yellow C orange); *apothecia minute*, scattered, *at first innate, then sessile, black*, plane, margin thin, entire; *hypothecium nigro-fuscous*; *spores* 8, fuscous, oblong, 1-septate, *small*.

On sub-alpine rocks, not common.

SYN :—*Calicium saxatile*, Schær. in Natur. Anz. Winterm. 35. (1821.) Enum. 166. Nyl. Scand. 237. Mudd Man. 216.

FIG :—Hepp Sporen t. 17. f. 145.

EXS :—Hepp 145. Zw. 140. Arn. 166. *a. b.* Rabh. 800. Anzi Langob. 198. Schær. 240.

GEOG. DISTRIB :—Bavaria, Switzerland, Lombardy, Italy.

BOT. PROV :—7...15...26 30.

SCOTLAND :—Near Nigg, Kincardine. *Rev. J. M. Crombie.*

IRELAND :—Divis Mountain co. Antrim. *Dr. Moore.* Doughruagh Mountain! Galway. *Mr. Larbalestier.*

WALES :—Barmouth. *Rev. T. Salwey.* Craig Breidden! Montgomeryshire. Drwsynant!

"Spores .002 to .0025 in. long, by .001 in. broad." (*Mudd.*) "Spores .009—.015 mm. long, .0045—.0065 mm. broad." (*Nyl.*) "Spores .009—14 mm. long, .004—6 mm. broad. Paraphyses cohærent, apices nigricanti-fuscescent. Asci I vinous-red, apices blue, the other parts dirty-blue." (*T. M. Fries.*) Spores .011—.012 mm. long, .005 mm. broad. Hymenium I blue.

198. *L. verruculosa*, (Borr.) *greenish-yellow*, thin, sub-determinate or effuse, *minutely areolato-rimulose, smooth, plane*, or *convexo-unequal*, (K yellow C red); hypothallus brownish-black; *apothecia minute, innate and solitary in the areolæ, black*, plane or depressed, margin thin, soon obliterated; *hypothecium dark-brown*; spores 8, fuscous, oblong, 1-septate.

On maritime and mountain rocks, not unfrequent. 1811.

SYN :—E. Bot. 2317. (1811.) Hook. Br. Fl. 2. 174. Mudd Man. 215.

FIG :—E. Bot. 2317.

EXS :—Leight. 189. Zw. 26. 135. 425. Anzi Langob. 196. Mudd 186.

GEOG. DISTRIB :—Germany, Lombardy.

BOT. PROV :—1...6, 7...10, 11...15...19...26.

ENGLAND :—Muggleswick Fell, West Durham. *Mr. Winch.* (1811.) Lynmouth. *Miss Attwood.* Laubraugh Rigg! Carlton Bank! Cleveland. *Mr. Mudd.*

SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND :—Dunkerron! *Dr. Taylor.* Hill near Cork! Blackwater Bridge and Lough Carag co. Kerry. *Mr. Carroll.* near Kylemore! Galway. *Mr. Larbalestier.*

WALES :—Barmouth! Llanachar Bridge! near Fishguard, Pembrokeshire.

"Spores .0025—.003 in. long by .00125—.00175 in. broad." (*Mudd.*) "Spores .014—16 mm. long, .007—9 mm. broad." (*T. M. Fries.*) Spores .013—16 mm. long, .006—.008 mm. broad.

The *kaleida*, Tayl. MS. and the *ocellata* forms of the continental lichenists appear to be only states of *L. verruculosa*, differing chiefly in the more dispersed areolæ of the thallus which surround the apothecia with a pseudo-thalline pro-

minent margin. Internally *L. verruculosa* has a nigro-fuscous lateral excipulum whilst in *kaleida* and *ocellata* this excipulum is colourless; the hypothecium being dark-brown in both and the spores of the same size.

Var. *præponens*, Nyl. *yellow, areolato-verruculose* or slightly granulato-verruculose, (K yellow C red); *apothecia sub-innate*, not margined by thallus, *rugulose, immarginate*; spores as above.

On maritime rocks, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 347. Crombie Enum. 94.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Portlethen! Kincardine. *Rev. J. M. Crombie.*
Merely a state of *L. verruculosa* not worth distinguishing. "Spores .015—17 mm. long, .008—.010 mm. broad." (*Nyl.*)

199. *L. stellulata*, Tayl. *white* or *albo-cinereous*, thin, suborbiculari-determinate, *minutely areolato-rimulose*, plane, smooth, (K yellow C—); hypothallus thin, black; *apothecia minute*, numerous, crowded and confluent, *sub-innate*, black, plane, margin thin, entire; lateral excipulum nigricant, *hypothecium brownish-black*; *spores* 8, fuscous, oblong, 1-septate, *small*.

On maritime rocks and stones, frequent. 1836.

SYN :—Tayl. Fl. Hib. 2. 118! (1836.) Mudd Man. 216.
EXS :—Leight. 276. Zw. 402. Larbal. 38.
FIG :—Hepp Sporen t. 34. f. 313.
GEOG. DISTRIB :—Germany, Switzerland, Falkland Islands.
BOT. PROV :—1, 2...5, 6, 7...12...19...24...30, 31.
ENGLAND :—Lynmouth. *Miss Attwood.* near Torquay! *Dr. Deakin.* Carlisle! *Mr. Heysham.* near Brighton! Ventnor, Isle of Wight; S. Devon and Cornwall. *Dr. Holl.* Plymouth. *Mr. Holmes.* Haughmond Hill! Shropshire.
IRELAND :—Carig Mountain! *Dr. Taylor.* Ardglass co. Down. *Dr. Maingay.* near Cork; Carrigogunnel near Limerick. *Mr. Carroll.*
WALES :—Aberdovey! *Rev. A. Bloxam.* Barmouth! Moel-y-Golfa! Montgomeryshire; Borth! Cardiganshire; Dolgelley! Crib Coch! Snowdon. Capel Curig! Llyn Dinas! near Beddgelert. Gimlet Rock! Pwlhelli. Fort Hill! near Fishguard, Pembrokeshire. Tremadoc!
CHANNEL ISLANDS :—Portelet Bay! La Moye! Jersey; Guernsey. *Mr. Larbalestier.*
"Spores .002 to .00275 in. long by .001 to .0015 in. broad. I blue." (*Mudd.*)
"Spores .009—12 mm. long. .004—5 mm. broad. I blue." (*T. M. Fries.*)
This is *Buellia minutula*, Hepp 313, according to Arnold in Flora 1872. p. 4. His *B. stellulata*, (Tayl.) l. c. is evidently made up, according to the Exs. quoted, of *L. verruculosa*, (Borr.) and *L. atroalbella*, Nyl. Confer Leight. Lich. Fl. p. 303. and 310. Paraphyses laxly cohærent, apices nigro-fuscous. Spores .009—.011 mm. long, .005—.0055 mm. broad.

*forma confluens*, Leight. *apothecia* very numerous and in such close juxtaposition as to appear *confluent*.

On rocks, rare. 1876.

BOT. PROV :—6, 7.
WALES :—Fort Hill! near Fishguard, Pembrokeshire. (1876.) near Tremadoc!

forma *dispersa*, Leight. *areolæ* of thallus *dispersed* and scattered.

On rocks, rare. 1876.

BOT. PROV :—6.
WALES :—Goodwick Bay! (1876.)

200. *L. scabrosa*, Ach. *citrine* or *flavo-virescent*, thin, *areolate* or *areolato-granulose*, (K yellow C—); *apothecia small*, scattered, *black*, opake, somewhat convex, *concolorous within*; *hypothecium black*; spores 8, fuscous, ellipsoid, 1-septate, small.

On the earth and on thallus of *Bœomyces rufus*, in mountainous regions, rare. 1808.

SYN :—Ach. Meth. 48. (1803.) Syn. 25. Nyl. Scand. 247. Flotow uber. Lec. scabrosa, &c. 74.
FIG :—E. Bot. 1878. Flot. l. c. 74. Hepp Sporen t. 63. f. 548.
EXS :—Hepp 548. Anzi Ven. 72. Anzi Langob. 205. Arn. 97.
GEOG. DISTRIB :—Bavaria, Italy.
BOT. PROV :—2...15...19...26.
ENGLAND : –Sussex. *Mr. Borrer.* (1808.)
SCOTLAND :—Morrone. *Rev. J. M. Crombie.* Ben Lawers. *Dr. Holl.*
IRELAND :—Bantry. *Miss Hutchins.* Twelve Pins ! Kylemore ! *Mr. Larbalestier.*
"Spores .012 –18 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .015 mm. long, .006 mm. broad.

201. *L. disciformis*, Fr. *pale-yellowish-white*, very thin, smooth, continuous or unequal or rimuloso-areolate, determinate, *(K yellow C—)*; *apothecia* numerous, scattered, moderate, plane, marginate, *black*; *hypothecium black*; spores 8, fuscous, lineari-oblong, 1-septate.

On trees, frequent.

SYN :—Fr. in Moug. St. Vosg. 745. Nyl. in Bot. Notis. 1852. p. 175. Scand. 236. in part. Mudd Man. 216.
FIG :—Nyl. Bot. Notis. 1852. f. 1.
EXS :—Fellm. 200. Maudon Mad. 1865. Mass. 268. A. B. Anzi 294. 295. Schær. 197. 199. M. & N. 745. in part. Mudd 187. 188. Zw. 349. Leight. 180. Hepp 754.
GEOG. DISTRIB :—E. Lapland, Italy, Switzerland, Germany, Madeira, Arctic America, Hungary.
BOT. PROV :—2, 3...5...7...10...12...15...19...31.
ENGLAND :—Chelmsford ! *Mr. Piggott.* Teeside ! *Mrs. Stanger.* Kildale ! Newton Wood ! Sowerdale ! *Mr. Mudd.* Llanforda ! Shropshire. *Rev. T. Salwey.* New Forest. *Rev. J. M. Crombie.* Toy's Hill, Seven Oaks, Kent. *Mr. Holmes.* Nesscliffe Hill ! Shropshire.
SCOTLAND :—Banchory ; near Aberdeen ; Braemar ; Callander ; Blair Athole. *Rev. J. M. Crombie.* Killin, ! Breadalbane ! Birks of Aberfeldy ! *Dr. Holl.*
IRELAND :—Askew Wood ! co. Kerry. *Dr. Taylor.* Castlebernard ! *Mr. Carroll.*
WALES :—Garth ! near Dolgelley. *Dr. Holl.* Benarth ! Conway ; Dolgelley ! Barmouth ! Tanybwlch Wood, Capel Curig ! Capel Arthog !
CHANNEL ISLANDS :—La Coupe ! Noirmont ; St. Peter's ! Jersey. *Mr. Larbalestier.*
"Spores .004 to .005 in. long by .0015—.002 in. broad. Spermogonia minute, punctiform, semi-immersed, black ; spermatia cylindrical, straight, .00125 in. long by .00012 in. broad." (*Mudd.*) "Spores .019—30 mm. long, .008—.014 mm. broad." *(Nyl.)* Spores .02—.029 mm. long, .009—.012 mm. broad.

202. *L. atroalba*, Ach. *griseo-pallescent* or cinereo-fuscescent, tartareous, *areolato-diffracto-granulose*, *areolæ plano-convex*, *(K brownish C brownish)*; apothecia plane, appressed, margin thickish, flexuose, black ; *hypothecium black* or *nigro-fuscous ;* spores 8, fuscous, oblong or oblongo-ellipsoid, 1-septate, *large*.

On maritime quartzose and schistose rocks, frequent.

SYN :—Ach. Prodr. 63. (1798.) Syn. 11. Nyl. Scand. 232. (excl. syn).
EXS :—Fr. L. S. 382. (fide Nyl.) Fellm. Lapp. 194.
GEOG. DISTRIB :—E. Lapland, Pyrenees, Sweden.
BOT. PROV :—1...6...15...19...26...31.
ENGLAND :—Moreton and North Bovey, Devon. *Rev. J. P. Jones.*
SCOTLAND :—Kincardine ! *Rev. J. M. Crombie.*
IRELAND :—On maritime rocks, frequent. *Mr. Carroll.* Clifden ! Connemara. *Mr. Larbalestier.*

WALES :—Fort Hill ! Goodwick Bay ! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

*L. spuria*, Schær. is similar externally, but differs in the colourless hypothecium, smaller spores and chemical reaction K yellow C red, and also from *L atroalbella* which has reaction K yellow then red. "Spores .024—.034 mm. long, .012—17 mm. broad." (*Nyl.*) Spores .025—.029 mm long, .013—.0145 mm. broad.

203. *L. badioatra*, Flk. *fuscous* or fusco-griseous, tartareous, *areolato-diffract*, *rimulose*, *areolæ plano-convex*, *scattered* or *concrescent (K brownish C tawny-yellow)*; *apothecia sub-innate*, appressed, plane, black, margin thin, entire or flexuose ; *hypothecium black* ; *spores* 8, fuscous, oblongo-ellipsoid, 1-septate, *large*.

On alpine schistose rocks, rare.

SYN :—Flk. in Sprengel N. Entdeck. 2. 95. (1821.) Schær. Enum. 111. Nyl. Scand. 233.
FIG :—Hepp Sporen t. 5. f. 32.
EXS :—Schær. 179. Anzi Langob. 191. Anzi It. S. 291. Hepp 753. 32.
GEOG. DISTRIB :—Switzerland, Austria, Norway, Transylvania.
BOT. PROV :—15...23.
SCOTLAND :—Loch-na-Cat, Ben Lawers. *Rev. J. M. Crombie.*
IRELAND :—Killarney. *Adm. Jones.*

Distinct from *L. atroalba* by the different reaction. "Spores .030—36 mm. long, .015—18 mm. broad." (*Nyl.*) "Spores .027—36 mm. long, .011—18 mm. broad." *(T. M. Fries.)* Spores .0295—.0305 mm. long, .012—.013 mm. broad.

204. *L. atrobadia*, Nyl. *dull-brown or greyish-brown*, thinnish, *areolato-diffract*, *hypothallus black*, *radiating at the circumference*, (medulla I—) ; *apothecia black*, somewhat convex, *immarginate*, concolorous within ; epithecium violet-brown, with K faintly purple ; hypothecium brown ; spores 8, brown or blackish, oblong, 1-septate ; gelatina hymenea intensely-bluish with iodine.

On quartzose rocks. 1871.

SYN : -Nyl. in Flora 1872. p. 361. Crombie in Journ. Bot. n. s. 2. 135.
BOT. PROV :—15.
SCOTLAND :—Summits of Ben-y-Gloe and Cairn Gowar, Blair Athole. *Rev. J. M. Crombie.* (1871.)

"Allied to *L. badio-atra*. Spores .028—30 mm. long, .010—14 mm. broad." (*Nyl.*)

205. *L. coniops*, (Whlnb.) *cinereo-ferruginous*, thickish, *verruculoso-granulate*, unequal, *granules minute*, *crenate*, at length conglomerate, (K—C—) ; hypothallus nigricant, radiant ; *apothecia minute*, *adnate*, *black*, naked, margin thin, elevated, entire ; *excipulum nigro-fuscous* ; *hypothecium fuscescent* ; paraphyses distinct, apices incrassate, fuscous ; asci ventricoso-clavate ; spores 8, fuligineo-fuscous, ellipsoid, obtuse at the apices, slightly constricted in the middle.

On maritime rocks, rare. 1870.

SYN :—Whlnbg. in Ach. Meth. Suppl. 8. (1803.) Ach. Syn. 20. Nyl. Scand. 237. Lapp. Or. 162.
EXS :—Th. M. Fries. 69.
GEOG. DISTRIB :—Norway, Lapland.
BOT. PROV :—15.
SCOTLAND :—Nigg and Portlethen. Kincardine ! *Rev. J. M. Crombie.*

"Spores .012—17 mm. long, .008—9 mm. broad. Spores .011—18 mm. long, .007—.011 mm. broad. (*Nyl.*) "Spores 011—18 mm. long, .007—11 mm. broad. Spermatia acicular, arcuate ; sterigmata simple." (*T. M. Fries.*) Spores .0175—19 mm. long, .0095 mm. broad.

206. *L. myriocarpa*, (DC.) *cinerascent*, thin, *unequal*, or *sub granulose*, *effuse* or *evanescent*, (K— C—) ; *apothecia small*, plane or sub-convex, black, margined ; *hypothecium nigro-fuscous* ; *spores* 8, fuscous, oblong, 1-septate, *small*, *epispore distinct*.

On trees, old wood palings, and rocks, frequent.

SYN :—D.C. Fl. Franc. 2. p. 346. (1805.) Ach. Syn. 18. Nyl. Scand. 237. Mudd Man. 217.

GEOG. DISTRIB —Italy, Sweden, Germany, Hungary, Switzerland, France, E. Lapland, Arctic America, South America.

"Spores .009—.016 mm. long, .0055—.0075 mm. broad. Spores .010—16 mm. long, .006—8 mm. broad." (*Nyl.*) "Spores .009—16 mm. long, .004—8 mm. broad." (*T. M. Fries.*) "Spores .003—.00325 in. long, .001—.00125 in. broad. Spermatia cylindrical, curved or undulate .003 in. long, by .00012 in. broad.' (*Mudd.*) Hypothecium a nigro-fuscous central mass separated from the nigro-fuscous lateral excipulum by a paler interval. Paraphyses distinct, cohærent, apices large, nigro-fuscous or nigricant. Spores .012—.015 mm. long, .0045—.006 mm. broad.

A. *Corticolar forms.*

forma *chloropolia* (Fr.) *thickish*, crustaceous, *viridi-cinerascent*, *rugoso-verruculose*, *unequal*.

On boarded buildings, old palings and trees (elm, pear).

SYN :—Fr. S. V. Sc. I. p. 115. (1846.)

EXS :—Fr. L. S. 353. Zw. 400. Schær. 528. 472. Leight. 63. Anzi It. Sup. 299.

GEOG. DISTRIB :—Scandinavia, Germany, Switzerland, Italy.

BOT. PROV :—2...5, 6...10...31.

ENGLAND :—Browston ! and Halesworth ! *Mr. D. Turner*. Stokesley ! Yorkshire. *Mr. Mudd*. Church Stretton ! Lyth Hill ! Shrewsbury ! Worfield ! Shropshire.

WALES :—Knighton ! Radnorshire.

CHANNEL ISLANDS :—Beauport ! *Mr. Larbalestier*.

forma *pinicola*, Ach. *thin*, *brownish-grey*, *effuse*, *pulverulento-granulose*.

On pines, yew, willow, frequent.

SYN :—Ach. Meth. p. 66. Hook. Br. Fl. 176.

FIG :—E. Bot. t. 1851. Hepp Sporen t. 6. f. 41. and 42.

EXS :—Hepp 41. 42. Schær. 200. Mass. 265. Anzi Ital. Sup. 298. Zw. 194. 194 B. Nyl. Par. 61. Mudd 190. Bohl. 124.

GEOG. DISTRIB :—Switzerland, Italy, Germany, France.

BOT. PROV :—2, 3...5...7, 8...10...20.

ENGLAND :—Sussex ! *Mr. Borrer*. Stokesley ! Yorkshire. *Mr. Mudd*. Twycross ! Leicestershire. *Rev. A. Bloxam*. near Lewknor ! Wheatfield Park ! Oxfordshire. *Mr. Larbalestier*. Copthorn ! Loppington ! Shrewsbury !

IRELAND :—Carrigaloe ! Great Island and Blarney ! Cork. *Mr. Carroll*.

WALES .—Bettws-y-coed !

forma *quercicola*, Rabh. *thin*, *whitish*, *effuse*, *slightly pulverulento-granulose*, or evanescent.

On oaks, rare. 1857.

SYN :—Rabenhorst L. Europ. Exs. 832.

EXS :—Rabh. 832.

GEOG. DISTRIB :—Europe.

BOT. PROV :—5...7...31.

ENGLAND :—Worfield ! Shropshire.

WALES :—Bettws-y-Coed ! between Corwen and Bala ! (1857.)

CHANNEL ISLANDS :—Maufant ! St. Saviour, Jersey. *Mr. Larbalestier*.

forma *saprophila*, Ach. *ecrustaceous*, *evanescent* ; *apothecia larger*, plane, margined, scattered or aggregate, *numerous*.

On subputrescent wood and stumps, probably not uncommon. 1856.

SYN :—Ach. L. Univ. p. 177. (1810.)
FIG :—Mass. Ric. 165. Hepp Sporen t. 17. f. 150.
EXS :—M. & N. 1328. Rabh. 729. Anzi It. S. 296. 300. 301. Hepp 150. Schær. 198. Richardson 144. 149.
GEOG. DISTRIB :—Switzerland, Germany, N. America.
BOT. PROV :—10...31.
ENGLAND :—Farndale ! Yorkshire. *Mr. Mudd.* (1856.)
CHANNEL ISLANDS :—St. Clement's Bay ! Jersey. *Mr. Larbalestier.*

B. *Saxicolar forms.*

forma *areolata*, Leight. *cinerascent*, thin, effuse, *minutely rimoso-areolate, areolæ plane* ; apothecia black, numerous, crowded, adnato-sessile, plane ; margin slightly prominent, thickish and paler, eventually obliterated ; excipulum lateral, nigro-fuscous, short ; hypothecium central nigro-fuscous ; paraphyses distinct, cohærent, apices very large, nigro-fuscous or nigricant ; spores 8, fuscous, oblong, 1-septate, small ; gelatina hymenea I violet.

SYN :—Leighton in Grevillea 5. p. 81. (1876.)
EXS :—Schær. 447.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—5, 6...26.
ENGLAND :—Caer Caradoc ! Shropshire. (1856.)
IRELAND :—Ballinahinch ! base of Doughruagh (east side) ! *Mr. Larbalestier.*
WALES :—Goodwick Bay ! near Fishguard, Pembrokeshire.
Spores .012—.014 mm. long, .006—.007 mm. broad. The thallus has no reaction with K or C, but when C is applied after being wet with K, a singular whitish effervescence ensues.

forma *leprosa*, Leight. *albido-cinerascent*, areolæ dissolved into a *leprose, pulverulent*, effuse condition.

SYN :—Leighton in Grevillea 5. p. 10. (1876.)
EXS: —Fellm. 197. Zw. 127. Leight. 181. Mudd 189.
GEOG. DISTRIB :—E. Lapland, Germany.
BOT. PROV :—5, 6 ..10...26.
ENGLAND :—Cliffrigg ! Yorkshire. *Mr. Mudd.* Haughmond Hill ! Shropshire.
IRELAND :—Kylemore Mountains ! *Mr. Larbalestier.*
WALES :—Goodwick Bay ! Newport Road ! near Fishguard, Pembrokeshire.

forma *ecrustacea*, Leight. *thallus* nearly or quite *evanescent and obliterated*, leaving the numerous minute *apothecia naked* and prominent.

SYN :—Leighton in Grevillea 5. p. 10. (1876.)
BOT. PROV :—2...5, 6...10...20...26.
ENGLAND :—Ashington Common ! Sussex. *Mr. Borrer.* Cliffrigg ! Yorkshire. *Mr. Mudd.* Haughmond Hill ! Sharpstones Hill ! Lyth Hill ! Longmynd ! Shropshire.
IRELAND :—Near Kilcully, Cork ! *Mr. Carroll*, near village of Glencorbot ! Doughruagh Mountain ! Galway. *Mr. Larbalestier.*
WALES :—Goodwick Bay ! St. David's ! Pembrokeshire. Chapel Lawn ! near Gaer Ditches, Radnorshire.
Intermediate states were often observable connecting the above forms. Externally f. *ecrustacea* resembles *L. dispansa*, Nyl., but the different spores prevent confusion. According to specimens received years ago from Mr. Borrer, as occurring with his true *L. prominula*, on flints on the Sussex Downs, this form would appear to be the lichen mentioned by him in E. Bot. Suppl. t. 2687, as probably "true *L. lygæa*, Ach." It should be remembered that Mr. Borrer determined his lichens by external characters alone, the confirmatory character of the spores being at that time scarcely thought of.

forma *opegraphina*, Leight. thallus obliterated; *apothecia coacervate into gyrocarpous or opegraphine minute clusters.*

SYN:—Leighton in Grevillea 5. p. 10. (1876.) Leight. Br. Graph. p. 12.
FIG:—Leight. Br. Graph. t. 5. f. 6. a. b.
BOT. PROV:—6, 7.
WALES:—Anglesea! *Rev. Hugh Davies.* North Cliff, Tenby! (1872.) Cwm Ffynnon Lloer! Nant Francon.

207. *L. vernicoma*, Tuck. *viridi-stramineous*, crustaceous, effuse, subtartareous, *composed of minute granules, at length conglomerated into a subrimose crust*; *apothecia black*, rather small, appressed, nearly plane, with a thin erect evanescent margin.

On stones and rocks.

SYN:—Tuck. Enum. Lich. N. Amer. Suppl. 1. p. 429. (1858.)
GEOG. DISTRIB:—N. America.
BOT. PROV:—31.
CHANNEL ISLANDS:—Fliquet Bay! and La Moye! Jersey. *Mr. Larbalestier.* Specimens from the above localities, which I have seen, are evidently saxicolar forms of *L. myriocarpa.*

208. *L. nigritula*, Nyl. *cinerascent, minutely granulose*, or pulvereo-granulose, thin, *indeterminate* or *evanescent*, (K— C—); *apothecia minute*, opake, plane or sub-convex, black, margin thin, soon obliterated; *hypothecium fuscous or fuscescent, excipulum lateral, nigro-fuscous; spores* 8, *fuscous*, ellipsoid or oblong, 1-septate, *minute*; *epispore thin.*

On trees, oak, pine, and wood, rare. 1861.

SYN:—Nyl. in Bot. Notis. 1853. p. 99. Scand. 238. Mudd Man. 217.
FIG:—Hepp Sporen t. 6. f. 43.
EXS:—Nyl. 62. Zw. 126. Hepp 43. Anzi It. S. 293.
GEOG. DISTRIB:—Paris, Germany, Switzerland, Italy, Hungary, Denmark, Sweden, Norway, Finland.
BOT. PROV:—2, 3...7...10.
ENGLAND:—New Forest, Hants. *Adm. Jones.* Farndale, Cleveland. *Mr. Mudd.* (1861.) Seven Oaks, Toy's Hill, Hythe, Kent! *Mr. Holmes.*
WALES:—Trefriw! Gimlet Rock! Pwlhelli (on grass), Dolgelley!
"Spores .007—11 mm. long, .0035—.0045 mm. broad." *(Nyl.)* "Spores .006—10 mm. long, .002—4 mm. broad." (*T. M. Fr.*) "Spores .00175—.00225 in. long, .00075 in. broad." *(Mudd.)* Spores .006—9 mm. long, .002—3 mm. broad.

209. *L. coracina*, Ach. *nigricant* or cinereo-nigricant, *areolato-rimoso-diffract, areolæ small, plane* or *convex, smooth*, (K yellow then red); *hypothallus very black; apothecia produced from the hypothallus*, small, innate or adpressed, very black, plane or convex, margin thin, entire; *hypothecium thick, black; thalamium pellucid;* paraphyses cohærent, apices nigricant; spores 8, *fusco-nigricant*, ellipsoid, 1-septate; gelatina hymenea intense-blue with iodine.

On alpine rocks, rare. 1808.

SYN:—Ach. Syn. 11. pro. p. (1817.) Smmrf. Lapp. 142. Nyl. Scand. 232. *L. atrata*, Sm. E. Bot. 2335. Mudd Man. 215.
FIG:—E. Bot. 2335. Mudd t. 4 p. 80.
EXS:—M. & N. 462. Fellm. 193. Crombie 92. Arn. 633.
GEOG. DISTRIB:—Norway, Lapland.
BOT. PROV:—7...10...15.
ENGLAND:—Near Easeby, Cleveland. *Mr. Mudd.* Staveley. *Mr. Martindale.*
SCOTLAND:—Head of Lochlee in Glen Esk, Angus. *Mr. G. Don.* (1808.) Cairngorm! *herb. Borrer.* Morrone. *Adm. Jones.*

WALES :—Barmouth. *Rev. T. Salwey.*
"Spores .012—17 mm. long, .007—.010 mm. broad." *(Nyl.)* "Spores .011—17 mm. long, .006—10 mm. broad." (*T. M. Fries.*) "Spores .003 to .0035 in. long by .0015 to .002 in. broad." *(Mudd.)* Spores .014—.0165 mm. long, .009 mm. broad.

210. *L. sub-disciformis,* Leight. *dirty-yellowish-white,* thin, *minutely areolato-rimulose, plane,* nigro-limitate, *(K yellow then red);* apothecia scattered, sessile, plane, blackish, more or less pruinose, margin thick, entire, paler; *hypothecium black;* hymenium pale-brown; spores 8, fuscous, oblong, 1-septate.

On rocks, not common. 1851.

GEOG. DISTRIB :—Europe.
BOT. PROV :—1...7...26...31.
ENGLAND :—Torquay! Devon. *Dr. Deakin.* Lamorna! Cornwall. *Rev. T. Salwey.*
IRELAND :—Salrack! Connemara. *Mr. Larbalestier.*
WALES :—Sychnant! near Conway; Diganwy! near Conway! Conway Mountain! Holyhead Mountain! Crib Coch! Snowdon.
CHANNEL ISLANDS :—South side of Jerbourg! *Mr. Larbalestier.*
Not to be confounded with *L. saxorum,* Mass. or *L. disciformis,* Fr. which have a different chemical reaction and other characteristics. Paraphyses distinct. Spores .013—.019 mm. long, .007—.008 mm. broad.

Var. *meiosperma,* Nyl. similar to the type, but with apothecia often cæsio-pruinose, and smaller spores. (K yellow then red.)

On rocks, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 478. Crombie. En. 88.
GEOG. DISTRIB :—Europe.
BOT. PROV :—31.
CHANNEL ISLANDS :—Jerbourg, Guernsey; Coast of Sark; Jersey! *Mr. Larbalestier.*
"Spores .009—.012 mm. long, .005—7 mm. broad." *(Nyl.)* Spores .01—.011 mm. long, .005—7 mm. broad.

211. *L. succedens,* Nyl. *whitish,* thin, *granulate,* unequal or sub-areolate; *apothecia fuscous-black,* moderate, margined, colourless within; *hypothecium fuscous or rubricoso-fuscous; spores* 8, *nigrescent, ellipsoid,* simple or 1-septate, *epispore thin;* paraphyses moderate, articulate, apex thickened, fuscous or fuscescent; gelatina hymenea cærulescent, then vinous-red with iodine.

On alpine micaceo-schistose rocks, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 372. Crombie En. 89.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Adm. Jones.* 1866.
Compare *L. secedens,* Nyl. Systematically near *L. nigritula,* Nyl. Spores .011—14 mm. long, .0045—.0055 mm. broad.

212. *L. Hookerii,* (Borr.) *white* or *pale-yellow,* consisting of *appressed* or *plicato-rugose squamæ,* somewhat farinose, effigurate at the circumference, (K faint yellow C faint yellow); *apothecia small, black,* plane; *hypothecium black;* spores 8, *fuscous,* ellipsoid, 1-*septate.*

On earth on alpine rocks, rare. 1808.

SYN :—Nyl. Prodr. 139.
GEOG. DISTRIB :—Italy, Helvetia, Pyrenees.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers! *Messrs. Hooker & Borrer.* (1808)

Imbedded in the thallus is a minute *Sphæria Hookerii*, Nyl. (*Dacampia*, Mass.) with ellipsoid 3-5-septate fuscous spores; see Leight. Ang. Lich. t. 27. f. 5. *Verrucaria*, Borr. in E. Bot. Suppl. 2622. f. 2.

213. *L. præcavenda*, Nyl. thallus obscure, thin, *scarcely visible; apothecia black*, plane or somewhat concave, margined, small; *hypothecium somewhat reddish-brown, above more intense in colour;* epithecium obscurely amber-brown; *spores* 8, *faintly blackish*, elliptical, 1-septate; *paraphyses slender*; gelatina hymenea blue then vinous-red with iodine.

On decaying holly, very rare. 1869.

SYN :—Crombie in Seeman Journ. Bot. 7. 232. (1869.) Enum. 88.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2.
ENGLAND :—Near Lyndhurst in New Forest. *Rev. J. M. Crombie.* (1869).
Distinct from *L. myriocarpa*, DC. by the form of the paraphyses and reaction with iodine, and from *L. adpressa*, Hepp, by the paraphyses and colour of spores and hypothecium.

214. *L. deludens*, Nyl. *whitish*, firm, *thin, rimose*, (K pale-yellowish), surrounded by a very thin, black hypothallus; *apothecia black, innate, circumcised*, plane, obtusely margined, concolorous within; *hypothecium brown; spores* 8, *fuscous*, 1-*septate;* paraphyses discrete, regular, moderate, clavate, brownish; gelatina hymenea I intensely-blue.

On weathered quartzose stones in alpine regions. 1871.

SYN :—Nyl. in Flora 1873. p. 289—300.
BOT. PROV :—15.
SCOTLAND :—Summit of Cairn Gowar, Blair Athole. *Rev. J. M. Crombie.* (1871).
"Allied to *L. colludens*, Nyl. Spores .022—27 mm. long, .008—13 mm. broad." (*Nyl.*)

215. *L. hyperiza*, Strn. *cinerascent or plumbeo-cinerascent*, thin, smooth, *continuous*, obscurely limited, (K—C—); *apothecia black, sessile*, plane or somewhat convex, *rather large*, margin obtuse, internally cinerascent; *hypothecium fuscescent, grumous*; *spores* 8, *fuscous, ellipsoid*, 1-*septate, very often with* 3 *or* 4 *nuclei, rather large*; *paraphyses* distinct, slender, *often articulate, apices branched, interspersed with numerous granules*; gelatina hymenea I intensely-blue, almost black.

On smooth bark of trees. 1874.

SYN :—Stirton in Grevillea 3. p. 35 (1874).
BOT. PROV :—15.
SCOTLAND :—near Killin, Perth. *Dr. Stirton.* (1874).
Spores .016—.022 mm. long, .009—.012 mm. broad. (*Strtn.*)

216. *L. excelsa*, Leight. *white*, thin, effuse, *areolato-rimose, areolæ plane* and flat, somewhat shining, *(K yellow C yellow); apothecia* black, or violet-black, small, *innate* or innato-sessile, *plane or somewhat concave*, margin thickish, prominent; hypothecium nigro-fuscous; paraphyses indistinct, apices nigro-fuscous, incrassate, I dirty-blue; spores 8, fuligineo-fuscous, oblong, 1-septate, small.

On micaceo-schistose rocks, rare. 1875.

SYN :—Leighton in Grevillea 4. p. 78. (1876).
BOT. PROV :—26.

IRELAND :—Summit of Kylemore Mountains! co. Galway. *Mr. Larbalestier.* (1875).
Spores .0155—.0165 mm. long, .007 mm. broad.

217. *L. impressula*, Leight. *albido-cinerascent, thin, filmy, rimulose, nigro-limitate, (K yellow then red); apothecia black, minute, punctiform*, numerous, crowded into small groupes of 3 or 4 or more, *impressed or sunken in the thallus, each sunken apothecium circumscissed so as to appear surrounded by a thin thalline margin;* hypothecium thin, nigro-fuscous; paraphyses indistinct, apices colourless; hymenium tinged with brown; *spores* 8, *fuscous, rotundo-oblong*, 1-*septate*, more or less constricted in the middle.

On bluish-grey slates, rare. 1876.

SYN :—Linnean Trans. 2d ser. vol. 1. p. 237.
FIG :—Linn. Trans. l. c. tab. 32. f. 1 and 2.
BOT. PROV :—6, 7.
WALES :—Llanachar Bridge! and Fort Hill! near Fishguard, Pembrokeshire (1876). Festiniog Road near Dolgelley! near Tremadoc!
Gelatina hymenea I dirty-blue. Spores .014—.0145 mm. long, .009 mm. broad. Several plants grow on the same stone, and by the union of their dark hypothallus map out the surface as in *L. geographica*. Allied to *L. stellulata*, Tayl. but distinct by the thin filmy nigro-limitate thallus, larger spores, 1-3rd larger, and the singularly impressed apothecia.

218. *L. ryssolea*, Leight. *albido-cinerascent, thick, tartareous, diffracto-areolate, areolæ* plane or subplano-convex, *irregularly wrinkled*, nigro-limitate, (K yellow then red); *apothecia nigro-fuscous, opake, rusty, large, prominent*, and sessile, numerous, margin thick, paler, entire or flexuose; *hypothecium very thick, fusco-nigricant;* hymenium thin, brownish, paraphyses indistinct, apices thickened, nigro-fuscous; *spores* 8, *fuscous, oblong*, 1-*septate, small.*

On Cambrian rocks, rare. 1876.

SYN :—Linnean Trans. 2nd ser. vol. 1. p. 237.
FIG :—Linn. Trans. l. c. t. 32. f. 5 and 6.
BOT. PROV :—6.
WALES :—Fort Hill! near Fishguard, Pembrokeshire (Sept. 1876.)
Spores .016—.017 mm. long, .007—.008 mm. broad. Gelatina hymenea I pale-dirty-blue. Medulla I—.

### ** *Hypothecium colourless.*

219. *L. atroalbella*, Nyl. *griseo-pallescent* or fusco-griseous or cinereo-fuscescent, *areolato-rimoso-diffract, areolæ small, plane, smooth*, (K yellow then red); *hypothallus nigro-fuscous; apothecia innate in the areolæ*, plane, margined; *hypothecium colourless;* spores 8, *fuscous*, ellipsoid, 1-septate.

On quartzose and schistose rocks, frequent.

SYN :—Nyl. Obs. Holm. 2. 11. (1853.) Mudd Man. 214.
FIG :—Hepp Sporen t. 5. f. 31. t. 61. f. 529.
EXS : —Hepp 31. 529. Mudd. 185. Leight. 184.
GEOG. DISTRIB :—Germany, Pyrenees, Sweden.
BOT. PROV :—5...10...19.
ENGLAND :—Near Easby! Battersea Bank! Lanbraugh Rigg! Cleveland. *Mr. Mudd.* Haughmond Hill! Lyth Hill! Bodbury Ring! near Church Stretton, Shropshire.
IRELAND :—Kilcurry! near Cork. *Mr. Carroll.*

"Spores .012—13 mm. long, .007—8 mm. broad. Spores .010—18 mm. long, .007—9 mm. broad." (*Nyl.*) "Spores .003 to .0035 in. long, .00125 to .00175 in. broad." (*Mudd.*) Spores .013 mm. long, .005—6 mm. broad.

220. *L. alocizoides*, Leight. *cinereo-albescent, tartareo-pulverulent*, almost evanescent, (K—C—); *apothecia* scattered, at first punctiform, *immersed*, then *emerso-adnate*, plane, *fuscous-black, when moistened paler badio-fuscous, margin paler; hypothecium colourless;* spores 8, fuscous, *rotundo-oblong*, 1-septate.

On calcareous rocks, 1851.

SYN :—*L. alociza*, Leight. Lich. Fl. 2d. ed. 310.
EXS :—Arn. 263. 264.
GEOG. DISTRIB :—Italy, Bavaria.
BOT. PROV :—1...5...7...20.
ENGLAND :—Buxton! Derbyshire. *Dr. Holl.* Torquay! *Dr. Deakin.* Weston-super-mare! *Mr. Joshua.* Llanymynech Hill!
IRELAND :—Carigaloe, Goat Island! *Mr. Carroll.*
WALES :—Eglwyseg rocks! Craig Breidden! Diganwy near Conway! (1851.) Llandudno!

Not *L. alociza*, Mass. Synm. 42. which is there described as having "diaphanous" or colourless spores. Paraphyses distinct, apices dark-brown. Spores .015—.016 mm. long, .008—9 mm. broad. Epispore narrow.

221. *L. leucoclinella*, Nyl. *white, cream-coloured* or *cinereous*, tartareous, *diffracto-areolato-verrucose, (K yellow C red)*; *apothecia appressed to the areolæ*, or subinnato-sessile, *black*, plane, sub-immarginate; *hypothecium colourless*; spores 8, fuscous, oblong, 1-septate.

On quartzose and schistose rocks, not common.

SYN :—Nyl. in litt. 1870.
EXS :—Leight. 217 (in part).
GEOG. DISTRIB :—Italy, Germany.
BOT. PROV :—2...5...7...26.
ENGLAND :—Shanklin! Isle of Wight. *Rev. T. Salwey.* Lyth Hill! Caer Caradoc! Shropshire.
IRELAND :—Clifden! Connemara. *Mr. Larbalestier.*
WALES :—Diganwy! near Conway.

Spores often nucleolate, epispore distinct, .013—.0145 mm. long, .008—9 mm. broad.

222. *L. occulta*, (Korb.) *pallido-lutescent*, effuse, *adnate, thin, minutely areolate, areolæ somewhat convex or ruguloso-glebulose;* hypothallus dark; *apothecia nigro-fuscous, very minute, adnate*, at first margined by the thallus, eventually free and somewhat convex, proper margin more or less visible; epithecium fuscous; *hypothecium lutescent*; paraphyses indistinct; *spores* 8, *fuscous, small, oblong*, 1-*septate*; thallus tinged yellow with K and on immediate subsequent application of C still yellow, but soon obliterated (K y C—).

On rocks, sparingly. 1872.

SYN :—Korb. Par. 186. (1865.) Leight. in Grevillea 1. p. 58. (1872.)
FIG :—Grevillea t. 4. f. 6.
EXS :—Leight. 217. (in part).
GEOG. DISTRIB :—Germany, Switzerland.
BOT. PROV :—5...7.
ENGLAND :—Lyth Hill! Shropshire.
WALES :—Diganwy near Conway! Bettws-y-coed! (1872.) Moel-y-gest!
Spores .015—.0155 mm. long, .0075—.008 mm. broad.

223. *L. discolor*, (Hepp.) *pale-cinereo-brownish*, thin, *tar-*

*tareous, minutely areolato-rimulose or almost continuous, areolæ plane, subverruculose,* limited by a more or less conspicuous *darkish-brown hypothallus (K y C y); apothecia blackish-brown, minute,* numerous, *adnate or subinnato-sessile, plane, margin thickish,* persistent, more or less flexuose; hypothecium colourless; paraphyses distinct, apices fuscous; spores 8, fuscous, 1-septate-oblong, cell, nucleolate, epispore distinct.

On rocks, chalks, flints, &c., not uncommon. 1842.

SYN :—Hepp Exs. 319. 320. *Lecanora discolorans,* Nyl. in Flora 1868 p. 347.
FIG :—Hepp Sporen t. 35 f. 319. 320.
EXS :—Anzi Langob. 193. 195.
GEOG. DISTRIB :—Italy, Hungary.
BOT. PROV :—1, 2...12...20.
ENGLAND :—Sussex Downs! *Mr. Borrer.* (1842). Penzance! *Rev. T. Salwey.* Torquay! *Dr. Deakin.* between Inge and Staveley! *Mr. Martindale.* Eastbourne! *Mr. Roper.*
IRELAND :—Whitepoint! Cork. *Mr. Carroll.*
Spores .019—.021 mm. long, .01—.011 mm. broad.

224. *L. interpolata,* Stirt. *fuscous or nigro-fuscous or black, minutely squamuloso-areolate,* areolæ appressed, contiguous or dispersed, determinate; hypothallus black; *apothecia black, small, adnate, plane, margined; hypothecium colourless;* paraphyses slender, not well discrete, apices fuscous-black, clavate, conglutinate; asci saccate; *spores* 8, *virescent or fuscous, ellipsoid,* 1-*septate, binucleate,* nuclei rather large, generally virescent and sometimes conjoined by a tube.

On rocks, rare. 1877.

SYN :—Stirton in Scottish Naturalist 4. 165. (1877).
BOT. PROV :—16.
SCOTLAND :—Near Garve. *Dr. Stirton.* (1877).
"Gelatina hymenea I blue then dark-violet, the asci vinoso-fulvescent." (*Stirt.*)

D. *Spores* 1-*septate, colourless.*

* *Hypothecium dark.*

225. *L. lutosa,* (Mont.) *dirty-ochraceous,* tartareous, *rimoso-areolate, areolæ plane,* sometimes lobulate, (K—C—); *apothecia black within and without,* at first innate and immarginate, then appressed, *plane,* margin thin, prominent, entire; *hypothecium black*; *spores* 8, colourless, *oblong,* 1-septate, small.

On mountain rocks, rare.

SYN :—Montagne M.S. in Schær. En. 116. (1850).
FIG :—Hepp Sporen t. 59. f. 506.
EXS :—Schær. 579. Zw. 348. Anzi Langob. 360. Hepp 506.
GEOG. DISTRIB :—Pyrenees, Germany, Switzerland, Hungary, Lombardy.
BOT. PROV :—1...5...7...10.
ENGLAND :—Thirsk, Yorkshire. *Mr. Baker.* Starcross! Devonshire! *Mr. Parfitt.* Llanymynech Hill! Shropshire.
WALES :—Cader Idris! north-west.
Spores .01—.012 mm. long, .005—6 mm. broad. Paraphyses distinct, apices incrassate, nigricant. Excipulum black, hypothecium brown-black.

226. *L. chalybeia,* Borr. cinereo-fuscescent or *leaden-black, thin, slightly tartareous, minutely cracked,* (K—C—); *apothecia*

*minute*, superficial, scattered, black, plane, margin entire, slightly elevated; *hypothecium nigro-fuscous*, thickish; lateral excipulum bluish-black; paraphyses distinct, apices nigricant; *spores* 8, colourless, lineari-oblong, 1-septate, *small*.

On rocks, tiles, flints, &c., not uncommon. 1831.

SYN :—Borr. in E. Bot. Suppl. 2687. Nyl. Prodr. 136. Mudd Man. 180.
FIG :—E. Bot. Suppl. 2687 f. 2. Hepp Sporen t. 4. f. 13. & t. 58. f. 498.
EXS :—Nyl. 139. Hepp 13. 498. Anzi Langob. 448.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...5, 6, 7...10...19...26...31.
ENGLAND :—Sussex ! *Mr. Borrer*. (1831.) Ayton ! Cleveland ; near Rievaulx, Bilsdale, Yorkshire. *Mr. Mudd*. near Brighton ; Laneast Down, Cornwall. *Dr. Holl*. Wrekin ! Pontesford Hill ! Haughmond Hill ! Shropshire.
SCOTLAND :—Ben Lawers and Craig Guie. *Rev. J. M. Crombie*.
IRELAND :—Dunkerron ! *Dr. Taylor*. Whitepoint ! near Cork ; Blackwater ; Blackstone Bridge ; *Mr. Carroll*. Kylemore ! Dawros Bridge ! Glencorbot ; Lettermore, co. Galway. *Mr. Larbalestier*.
WALES :—Abergwynant ! Dolgelley. *Dr. Holl*. Trefriw falls !
CHANNEL ISLANDS :—Bonne Nuit ; Rozel Valley ! Jersey. *Mr. Larbalestier*.
"Spermogonia minute, punctiform, semi-immersed. Spermatia ellipsoid, short .0005 in. long, by .0001 in. broad. Spores .002 to. 0025 in. long, by .0005 to .00075 in. broad." (*Mudd.*) "Spores .007—.010 mm. long, .0025—.003 mm. broad." *(Nyl.)* Spores .007—.012 mm. long, .0025—.0035 mm. broad.

forma *ecrustacea*, Leight. thallus evanescent and obliterated.

WALES :—Goodwick Bay ! Pembrokeshire. (1876).

227. *L. umbrinella*, Nyl. *umbrine-brown, thin, subrugulose, rimulose ; apothecia black*, somewhat prominent, plane, submargined, whitish within ; *epithecium and hypothecium brown* ; *spores* 8, *colourless, fusiform, simple or* 1-*septate* ; paraphyses with brown clavate apices ; gelatina hymenea I bluish then vinous-reddish.

On micaceous rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 309.
BOT. PROV :—26.
IRELAND :—Dawros river, Connemara. *Mr. Larbalestier*. (1876).
"Spores .008—.014 mm. long, .002—3 mm. broad. Nearest to *L. prominula* Borr. but with thinner thallus and different reaction with iodine." *(Nyl.)*

228. *L. applanata*, (Fr.) *griseo-pallescent*, thin, *disperso-areolate*, areolæ plano-convex, depressed, (K brownish C brownish) ; *hypothallus nigricant predominating ;* apothecia black, plane, innato-sessile, margin thick ; hypothecium black ; paraphyses conglutinate, apices clavate, fusco-nigricant ; spores 8, colourless, oblong, 1-septate.

On quartzose and schistose rocks, not common. 1856.

SYN :—Fr. S. V. Sc. p. 116. (1846). *L. atroalba var. chlorospora*, Nyl. Lich. Holm. 1. in Bot. Notis. 1853. p. 6. Scand. 233. *L. colludens*, Nyl. in Flora 1870, p. 38. Leight. L. Fl. 2d ed. 314.
EXS :—Fr. L. Su. 382 C. (fide T. M. Fries. L. Scand. 618). Arn. 232.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—6, 7...15...26.
SCOTLAND :—Killin ! Breadalbane. *Rev. J. M. Crombie*. Ben Lawers ! *Dr. Stirton*.
WALES :—Barmouth ! Cwm Glas ! Snowdon ; Llyn-y-Cae ! Cader Idris ; Pen Cow ! near Fishguard, Pembrokeshire ; Towyn ! Holyhead !
IRELAND :—Kylemore ! Salrock Road ! co. Galway. *Mr. Larbalestier*.
"Spores .018—27 mm. long, .009—.014 mm. broad." *(Nyl.)* "Spores .016—29 mm, long, .006—13 mm. broad." (*T. M. Fr.*) Gelatina hymenea I dark-blue. Spores .026 mm. long, .011 mm, broad, colourless, sometimes fuscescent.

229. *L. atroalbicans*, Nyl. *whitish, granulato-areolate*, thin, tartareous, effuse, *areolæ minute, more or less scattered, convex or plane*, (K—C—); *apothecia black*, small, *innato-sessile*, plane, margined; *hypothecium nigro-fuscous;* paraphyses distinct, cohærent, apices nigro-fuscous; *spores* 8, *colourless, broadly-oblong*, 1-*septate, epispore distinct.*

On rocks, rare. 1876.

SYN:—Nyl. in Flora 1875. p. 363.
EXS:—Arn. 559. c.
BOT. PROV:—26.
IRELAND:—Ruins at Cleghan! Lettermore! Connemara. *Mr. Larbalestier.* (1876).
Gelatina hymenea I pale-blue then darkly-fuscescent. Spores .021—.0245 mm. long, .01—.012 mm. broad.

230. *L. alpicola*, (Schær.) like *L. geographica*, but with *spores colourless*, 1-*septate.*

On alpine whinstone rocks, very rare. 1869.

SYN:—*L. geographica var. alpicola*, Schær. Spic. 124. (1833.) Nyl. Prodr. 143. Crombie in Seem. Journ. Bot. 8. 99.
EXS:—Schær. 173. Hepp 151.
GEOG. DISTRIB:—Switzerland, France, Pyrenees, Sweden, Asia.
BOT. PROV:—15.
SCOTLAND:—Summit of Ben Nevis. *Rev. J. M. Crombie.* (1869).

231. *L. grossa*, (Pers.) *cinerascent* or *cinereo-virescent* or *cinereo-albicant*, thin, continuous or rimose, unequal, indeterminate, (K—C—); *apothecia large*, scattered, *sessile*, plane, *black, disk minutely papillate, margin thickish*, more or less flexuose and *polished;* excipulum lateral, thick, internally and externally bluish-black with a central paler stratum, *hypothecium black; spores* 8, colourless, oblong or ellipsoid, 1-septate, *very large.*

On trees, elm, ash, oak, not uncommon.

SYN:—Persoon in Herb. Mougeot fide Nyl. Prodr. 139. Nyl. Scand. 239. *Lecidea premnea*, Fr. L. S. Exs. 26. *Lecidea leucoplaca*, Chev. Fl. Paris. 1. 572. Mudd Man. 181.
FIG:—Hepp Sporen t. 73. f. 647.
EXS:—Fries L. S. 26. fide Nyl. Hepp 647. Mudd 147. Leight. 125. Rabh. 869. Zw. 423. Nyl. 66. Arn. 436.
GEOG. DISTRIB:—Europe, Sweden, Norway, Denmark, France, Germany, America, Australia.
BOT. PROV:—1, 2, 3...5, 6, 7...10, 11...13...15...19, 20...24...26...30, 31.
ENGLAND:—Airyholme Wood! Kildale! Cleveland. *Mr. Mudd.* Torquay! Devon. *Dr. Deakin.* The Lodge! near Ludlow, Shropshire. *Rev. T. Salwey.* Sussex! *Mr. Borrer.* Durham! *Rev. J. Harriman.* near Malvern; near Newton Bushell; near Shanklin. *Dr. Holl.* Stoke Wood, Exeter. *Mr. Parfitt.* Rivenhall, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* South Cerney near Cirencester. *Mr. W. Joshua.* Abdon! Shropshire.
SCOTLAND:—Invercauld! Braemar. *Dr. Lindsay.* Glencoe! *Mr. Borrer.* Crummach! Ayrshire. *Mrs. Dobie.* Kenmore, Perthshire. *Dr. Holl.* Braemar! Killin. *Rev. J. M. Crombie.*
IRELAND:—Derriquin! co. Kerry. *Dr. Taylor.* Blarney, Cork; Killarney, Kerry; and Dromoland, Clare; Loughcooter, Galway. *Mr. Carroll.* near Belfast. *Mr. Templeton.* Castletaylor, Galway. *Dr. Moore.* Curraghmore, Waterford. *Adm. Jones.* Lord Sligo's demesne, Westport! co. Mayo. *Mr. Larbalestier.*
WALES:—Hendreforion! near Barmouth. *Rev. T. Salwey.* Fronfraith, Aberystwith. *Miss Attwood.* Llanbedrog!
CHANNEL ISLANDS:—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .024—.03 mm. long, .012—19 mm. broad. Gelatina hymenea I blue then vinous-red. Spermatia oblongo-ellipsoid .002—3 mm. long, .001 mm. broad." (*Nyl.*) "Spores .02—.03 mm. long, .008—18 mm. broad." (*T. M.*

*Fries.*) "Spores .006—7 in. long by .003 in. broad." (*Mudd.*) Paraphyses slender, conglutinate, apices fuliginous. Spores .022—.027 mm. long, .013—.0145 mm. broad; epispore thick.

232. *L. Laureri*, (Hepp) *whitish*, very thin, smooth, *contiguous or rimulose*, (K yellow C—); *apothecia violet-black*, moderate, numerous, solitary or confluent, plane or plano-convex, sessile, margin thin, pale, soon obliterated, internally dusky; *hymenium violet-black; hypothecium reddish-violet-black; excipulum pale*, not black or black-purple; paraphyses cohærent, apices fuligineo-nigricant; gel. hym. I blue then darkly discoloured; spores 8, colourless, oblong or ellipsoid, 1-septate.

On trees, rare. 1869.

SYN:—*Catillaria Laureri*, Hepp in Arn. Exs. 353. (1867). T. M. Fries L. Scand, 582. *Lecidea intermixta*, Nyl. Scand. 194. (excl. var.) Leight. L. Fl. 2nd ed. 314. Crombie En. 64.

EXS:—Arn. 353. Rabh. 804. Zw. 397.

GEOG. DISTRIB:—Sweden, Denmark.

BOT. PROV:—2...31.

ENGLAND:—New Forest! near Lyndhurst, and Ringwood, Hants. *Rev. J. M. Crombie.* (1869).

"Spores .012—17 mm. long, .006—.0075 mm. broad." (*T. M. Fries.*) Spores .016 mm. long, .007 mm. broad. Apothecia when moistened dark, from the dark hypothecium, which, as well as other characters, distinguish it from *L. atropurpurea*, Schær., with which it is apt to be confounded.

233. *L. contristans*, Nyl. *fuscous* or *fusco-nigricant*, thin, *granulose;* apothecia *black*, somewhat convex, *immarginate, dusky within;* spores 8, colourless, ellipsoid or oblong, 1-septate; paraphyses indistinct; epithecium nigricant; *hypothecium dusky;* gelatina hymenea cærulescent, then dusky-yellow with iodine.

On mosses in alpine localities, rare. 1864.

SYN:—Nyl. in Flora 1865. p. 354. Crombie En. 72.

GEOG. DISTRIB:—Europe.

BOT. PROV:—15.

SCOTLAND:—Near summit of Ben Lawers. *Mr. Carroll.* (1864.)

"Systematically near *L. melæna*, Nyl. Spores .010—14 mm. long, .0045—.0065 mm. broad." (*Nyl.*)

234. *L. Templetoni*, Tayl. *greyish-white*, thin, effuse, *granulose*, (K—C—); *apothecia* moderate, *more or less crowded*, sessile, *black, slightly polished*, plane, with a thin entire or flexuose margin; *hypothecium* thick, *brownish-black;* paraphyses conglutinate, rich-yellow-brown, apices darker; spores 8, colourless, oblong or obtusely fusiformi-oblong, 1-septate.

On mosses, rare. 1836.

SYN:—Tayl. Fl Hib. 2. 123. (1836.) Mudd Man. 189.

GEOG. DISTRIB:—Europe.

BOT. PROV:—5...7...11...15...19...29, 30.

ENGLAND:—Oswestry! Shropshire. *Rev. T. Salwey.* Teesdale! *Rev. J. Harriman.*

SCOTLAND:—Ben Lawers. *Adm. Jones.*

IRELAND:—Near Belfast! *Mr. Templeton.* near Bantry. *Miss Hutchins.* North of Ireland. *Adm. Jones.* Lisburn. *Dr. Dickie.*

WALES:—Twll Dû, Cwm Idwal! Cwm Tryfaen! Cwm Bochlwyd! Glyder Vach!

"Spores .003—.004 in. long by .001 in. broad." (*Mudd.*) Spores .013—.025 mm. long, .005 mm. broad.

235. *L. anomaloides*, Nyl. *whitish*, thin, *granulose* or evanescent;

*apothecia fusco-nigricant* or *fusco-pallescent* or *black*, small, sub-convex, immarginate; *hypothecium fuscous-black; spores* 8, colourless, oblong, 1-*septate*.

On schistose earth in mountainous districts, rare. 1860.

SYN :—Nyl. in Flora 1862. p. 464. Crombie En. 70.
GEOG. DISTRIB :—France.
BOT. PROV :—15.
SCOTLAND :—(forma denigrans, Nyl. in. litt.) Ben Lawers. *Adm. Jones.* (1860).

236. *L. candida*, (Web.) *white, squamulose*, squamæ *swollen, lobato-plicate, congested and imbricate in the centre*, lobed at the circumference, *densely albo-granulato-farinose, (K—C—); apothecia* appressed, black, *cæsio-pruinose*, plane or somewhat convex, margin thickish, entire, flexuose; *hypothecium reddish-brown;* spores 8, colourless, *fusiform, obtuse*, 1-septate.

On the earth among alpine rocks, rare.

SYN :—Weber Spicil. 193. (1778.) Ach. Syn. 50. Nyl. Scand. 215. Mudd Man. 172.
FIG :—Hoffm. Pl. Lich. t. 33. f. 2. Hepp Sporen t. 15. f. 124.
EXS :—Hepp 124. Zw. 347. Anzi It. S. 244. M. & N. 642. Mass. 308. Schær. 167.
GEOG. DISTRIB :—Europe, Norway, Sweden, Germany, Switzerland, Italy, Pyrenees, Hungary, Africa, America.
BOT. PROV :—1...7...15.
ENGLAND :—Anstey's Cove, Torquay. *Mr. Holmes.*
SCOTLAND :—Ben Lawers. *Adm. Jones & Crombie.*
WALES :—Great Orme's Head! Carnarvonshire.

A section of the apothecium shows the hymenium to rest on a pale-reddish-brown dense hypothecium, which is subtended by a horny striated paler excipulum, externally marked with a thin dark-brown line. By this and the different chemical reaction at all times distinguishable from *L. cæruleonigricans.* "Spores .004—.005 in. long, by .00075 in. broad." (*Mudd.*) "Spores .016—23 mm. long, .0035—.0045 mm. broad." (*Nyl.*) "Spores .016—24 mm. long, .003—4 mm. broad. Gelatina hymenea I blue, especially the apices of the asci, then vinous-red." (*T. M. Fries.*) Spores .022 mm. long, .004 mm. broad.

237. *L. cæruleonigricans*, (Lightf.) *glaucous* or *cæruleo-nigricant* or *pallido-olivaceo-fuscescent, squamulose, squamæ bullate* or *bullato-plicate* in the centre, rotundato-lobate at the circumference, *smooth, cæsio-pruinose, (K dirty-brown); apothecia* elevated, sessile, *bluish-black, naked* or *cæsio-pruinose*, plane, margin thick, obtuse, entire or flexuose; *hypothecium nigro-fuscous; spores* 8, colourless, *fusiform, acute*, 1-septate.

On the earth among maritime calcareous rocks, frequent. 1772.

SYN :—Lightf. Scot. 805. (1777). *L. vesicularis*, Hffm. Pl. Lich. 2. 30. Ach. Syn. 51. Nyl. Scand. 214. Mudd Man. 173. Leight. Lich. Fl. 2nd ed. 313.
FIG :—Hffm. Pl. Lich. t. 32. f. 3. E. Bot. 1139.
EXS :—Anzi It. S. 241. (in part) 242. Larbal. 34. Mass. 274. 275. Mudd 143. M. & N. 172. Schær. 168. Bohl. 67.
GEOG. DISTRIB :—Portugal, Algeria, Germany, Switzerland, Italy, France, Pyrenees, Austria, Hungary, Sweden, Norway, Finland, Arctic America, Cape Horn, Asia.
BOT. PROV :—1, 2...4, 5...7, 8...10, 11, 12...15...19 . 23...29, 30, 31.
ENGLAND :—Near Buxton; near Torquay; Ventnor, Isle of Wight. *Dr. Holl.* Westleigh! Devon. *Mr. Parfitt.* Cambridgeshire. *Rev. Mr. Hemsted.* Teesdale, Durham. *Rev. J. Harriman.* Westmoreland. *Mr. Brunton.* near Bristol. *Miss Attwood.* Gogmagog Hills, Cambridgeshire. *Mr. Hailstone.* Malham. *Dr. Carrington.* near Babbicombe. *Adm. Jones.* Hurstpierpoint. *Mr. Hemmings.* Oswestry! Shropshire. *Rev. T. Salwey.* Bray Hill, St. Minver near Padstow! *Mr. Tellam.* Folkestone, near Sibertswold, near Waldershare Park, Dover,

*Mr. Holmes.* South Cerney near Cirencester. *Mr. W. Joshua.* Yewbarrow Hill Grange, Lancashire. *Miss Attwood.* Llanymynech Hill! Shropshire.

SCOTLAND:—Highlands. *Rev. J. Lightfoot.* (1772.) Ben Lawers. *Dr. Holl.* Craig Guie! Appin! Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND:—North Wall, Dublin. *Mr. Brown.* near Baldoyle. *Dr. Taylor.* near Cork and Middleton. *Mr. Carroll.* North of Ireland. *Dr. Moore.*

WALES:—Puffin Island, Anglesea. *Rev. A. Bloxam.* Great Orme's Head! Eglwyseg rocks!

CHANNEL ISLANDS:—Quenvais! Jersey! Cobo, Guernsey. *Mr. Larbalestier.*

"Spores .003—.0035 in. long, by .00075 in. broad." (*Mudd.*) "Spores .018—30 mm. long, .002—4 mm. broad." *(Nyl.)* "Spores .014—25 mm. long, .002—4 mm. broad. Gelatina hymenea I blue then vinous-red. Spermatia filiform, arcuate." (*T. M. Fries.*) A section of the apothecium shows the hymenium to rest on a nigro-fuscous hypothecium, subtended by a pale mass, with an external thickish nigro-fuscous excipulum. Spores .0145 mm. long, .0035 mm. broad.

### ** *Hypothecium colourless.*

### † *Apothecia black.*

238. *L. sub-nigrata*, Nyl. *cinereo-nigricant, furfuraceo-diffract, granulose*, (K—C—); *apothecia fuscous-black*, convex, immarginate, *generally conglomerate*, internally colourless; *hypothecium colourless; spores* 8, colourless, ellipsoid, 1-septate, *small;* paraphyses indistinct.

On alpine rocks, rare. 1866.

SYN:—Nyl. in Flora 1866. p. 370.
GEOG. DISTRIB:—Europe.
BOT. PROV:—5...7...11...15.

ENGLAND:—Force Garth, Teesdale. *Dr. Holl.* Bathampton! *Mr. Joshua.* Abdon Burf! Shropshire.

SCOTLAND:—Ben Lawers; Crainlarick. *Dr. Holl.* Craig Tulloch. *Rev. J. M. Crombie.*

WALES:—North side of Cader Idris! (1866.) Crib Coch! Snowdon! Aran Mowddwy!

"Vix separanda a *L. denigrata*," Nyl. "Spores .009—.011 mm. long, .004—5 mm. broad. Epithecium darkly lutescent." *(Nyl.)* Spores .010—.013 mm. long, .004—.005 mm. broad.

239. *L. subviridis*, Nyl. *greenish or dusky-dark-green, thin, continuous, granulato-rugulose*, (K—C—); *apothecia black, minute*, scattered, *sessile, distinctly margined; hypothecium colourless, lateral excipulum brownish;* epithecium plane, brown; *spores* 8, *colourless, oblong or oviform*, 1-*septate;* paraphyses moderate, apices rather large, roundish, dark-brown; gelatina hymenea bluish, then tawny-red with iodine.

On siliceous stones. 1873.

SYN:—Nyl. in Flora 1873. p. 289. 300.
BOT. PROV:—31.

CHANNEL ISLANDS:—Noirmont Bay, Jersey. *Mr. Larbalestier.*

"Belongs probably to the section of *L. arthoniza*. Spores .011—16 mm. long, .005—7 mm. broad." (*Nyl.*) Spores .009—.010 mm. long, .003—4 mm. broad.

240. *L. melastigma*, Tayl. *reddish-black, thin, continuous, minutely granulato-areolate*, hypothallus predominating, *areolæ greenish when wet*, (K—C—); *apothecia black, minute*, scattered, *sessile, plane, with a thickish margin*, at length convex and immarginate; *hypothecium pale-yellow, lateral excipulum nigro-fuscous; hymenium pale-blue in the lower part*, paler or nearly colourless above, para-

physes distinct, apices nigro-fuscous; *spores* 8, *colourless, linearioblong,* 1-*septate.*

On siliceous rocks.

SYN :—Tayl. in Mack. Fl. Hib. pt. 2. p. 115. (1836.) Mudd Man. p. 180.
BOT. PROV :—19.
IRELAND :—Near Dunkerron! co. Kerry. *Dr. Taylor in herb. Borrer.*
Gelatina hymenea I blue. Spores .015—.016 mm. long, .0045—.005 mm. broad. With a general external resemblance to *L. subviridis*, Nyl.

241. *L. scotinodes*, Nyl. *dark-greyish*, thin, unequal, *areolato-rimose*, sub-determinate; *apothecia black, convex, immarginate, whitish within; hypothecium colourless; spores* 8, *colourless, oblong, simple or* 1-*septate;* paraphyses moderate, incrassate at the apices, dark-bluish-black; epithecium K—, faintly violet; gelatina hymenea I bluish and then vinous-red.

On micaceous rocks, rare. 1871.

SYN :—Nyl. in Flora 1873. p. 289. 300.
BOT. PROV :—15.
SCOTLAND :—Craig Tulloch, Blair Athole. *Rev. J. M. Crombie* (1871.)
"Allied to *L. scotina*, (Krbr.) but differs as above. Spores .014—18 mm. long, .005—6 mm. broad." (*Nyl.*)

242. *L. sub-confusa*, Nyl. *darkly virescent*, slightly *granulato-concrescent, areolato-diffract; apothecia black, opake, innate*, convex, internally concolorous; paraphyses thickish, somewhat indistinct, apices cærulescenti-infuscate; *hypothecium colourless; spores* 8, *colourless, oblong,* 1-*septate.*

On rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 307.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—26.
IRELAND :—Tullywhee Bridge! Kylemore, Connemara. *Mr. Larbalestier.* (1876.)
"Spores .007—8 mm. long, .0035 mm. broad. Gelatina hymenea I blue then vinous-red. Spermatia oblong, straight. Somewhat resembling *L. fuliginosa*, Tayl. but with a thallus darkly-cinerascent above and smaller spores." (*Nyl.*) Spores .012-.0135 mm. long, .005-6 mm. broad. Gelatina hymenea I dark-blue.

243. *L. columnatula*, Nyl. *darkly-virescent, granulato-concrescent, areolato-diffract; apothecia black, innato-sessile*, plane or plano-convex, slightly margined, soon obliterated, *somewhat shining; hypothecium colourless, opake, subtended by a pale-brownish horny excipulum;* hymenium cinerascent, paraphyses cohærent, apices nigrescent; *spores* 8, *colourless, lineari-oblong, slenderly* 1-*septate;* gelatina hymenea I dark-dirty-blue.

On rocks, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 228.
BOT. PROV :—26.
IRELAND :—Kylemore! *Mr. Larbalestier.* (1877.)
"Spores .012—16 mm. long, .004 mm. broad. Spermatia oblong .0030—.0035 mm. long, .0006 mm. broad. Sterigmata articulate and branched." (*Nyl.*) Spores .012—.0145 mm. long, .004—.005 mm. broad.

244. *L. biformigera*, Leight. *dirty-whitish-subvirescent*, thick, tartareous, *verrucoso-areolate, rimoso-diffract, (K yellow C yellow); apothecia* very variable in size, *black or bluish-black, either small, conglomerate*, plane and slightly margined, *or large, simple, sessile,*

prominent and with a thickish flexuose margin; *hypothecium colourless;* hymenium pale-bluish upwards, paraphyses distinct, apices nigrescent; *spores* 8, colourless, *narrowly oblong*, 1-*septate*, *cells binucleolate*.

On alpine and maritime rocks, rare. 1866.

SYN :—Leight. in Ann. and Mag. Nat. Hist. 1867.
GEOG. DISTRIB :—Europe.
BOT. PROV :—6, 7...26.
WALES :—North escarpment of Cader Idris! (1866.) Llyn-y-Cae! Cader Idris; rocks near Llyn Aran! Cader Idris; Manorbeer! near Tenby. Llanbedrog! Barmouth! Pen-y-rhiw! near Fishguard, Pembrokeshire. Moel-y-gest!
CHANNEL ISLANDS :—Coast of Alderney! *Mr. Larbalestier.*
The spores are similar in shape and size to those of *Verrucaria biformis*, Borr. .014—.015 mm. long, .004—.005 mm. broad. Gelatina hymenea I blue.

forma *subbiformata*, Nyl. thallus *areolato-diffract*, *areolæ plane*.

On alpine rocks, not unfrequent. 1866.

BOT. PROV :—7...26.
IRELAND :—Doughruagh Mountain! Kylemore! near Tully; co. Galway. *Mr. Larbalestier.*
WALES :—Llyn-y-Cae! Cader Idris. (1866.)

245. *L. holomeloides*, Nyl. *dusky* or *nigricant*, thin, effuse, *subgranulate;* apothecia *black*, somewhat convex, immarginate, *dusky within;* spores 8, colourless, oblong or sub-bacillar, 1-septate, variable in size; paraphyses indistinct; epithecium nigricant; *hypothecium nearly colourless or very slightly fuscescent*; gelatina hymenea slightly blue, then yellowish, with iodine.

On micaceo-schistose earth in alpine places, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 369. Crombie En. 70.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Near summit of Ben Lawers. *Adm. Jones.*
"Approaching *L. globulosa*, Flk. but with the aspect of *L. melæna*, Nyl. Spores .010—17 mm. long, .0030—.0035 mm. broad." (*Nyl.*)

246. *L. Lightfootii*, (Sm.) *greenish-white*, *tartareous*, *effuse*, *granuloso-verrucose*, (K—C—); *apothecia sub-innato-sessile*, plane, polished, black, *margin* thin, smooth, *paler*, *flexuose*; *hypothecium pale-grey*; excipulum pale-brown; hymenium brownish, paraphyses conglutinate, apices fuscous; spores 8, colourless, lineari-oblong, 1-septate, *cells rounded and slightly dilated* at the apices, small.

On trees, birch, rare. 1784.

SYN :—Sm. E. Bot. 1451. (1805.) Ach. Syn. 34. Nyl. Prod. 105. Mudd Man. 179.
FIG :—E. Bot. 1451. Hepp Sporen t. 58. fig. 503.
EXS :—Hepp 503. Schær. 581. (in part), M. & N. 839.
GEOG. DISTRIB :—France, Germany.
BOT. PROV :—2, 3...5...13...31.
ENGLAND :— *Rev. J. Lightfoot.* (1784.) Sussex! *Mr. Borrer.* Essex. *Mr. Piggott.* Oswestry! Shropshire. *Rev. T. Salwey.* Lyndhurst, New Forest. *Rev. J. M. Crombie.* Ardingley! Sussex. Duntisburne Abbots! near Cirencester. Reigate Hill, Surrey. *Mr. W. Joshua.* Lewknor! Tetsworth! Oxfordshire. *Mr. Larbalestier.*
SCOTLAND :—Caerlaverock road! Dumfries. *Dr. Lindsay.*
IRELAND :—North of Ireland. *Dr. Scott.*
CHANNEL ISLANDS :—Patrimoine, Jersey. *Mr. Larbalestier.*
"Spores .002 in. long by .00075 in. broad. Spermogonia minute, punctiform, immersed in the thallodal verrucæ, brown. Spermatia sub-cylindrical or ellipsoid .0005—.00075 in. long by .00012 in. broad." (*Mudd.*) Spores .009—.010 mm. long, .004 mm. broad.

forma *commutata*, (Ach.) thallus dissolved and *pulverulent*.

On trees, beech, and birch, rare.

SYN :—Ach. L. U. 352? Mass. Ric. 136. Mudd Man. 179.
FIG :—Mass. Ric. f. 269.
EXS :—Zw. 373. Hepp 744. Schær. 581 (in part).
GEOG. DISTRIB :—Germany.
BOT. PROV :—2...19...24...28.
ENGLAND :—Sussex ! *Mr. Borrer.*
IRELAND :—Cahirlogue; Ardrum near Cork; Killaloe, Clare. *Mr. Carroll.* Armagh near the Obelisk. *Adm. Jones.*
Spores as in the type.

247. *L. globulosa*, Flk. *greyish-white*, thin, effuse, *granuloso-leprose*, *(K—C—)*; *apothecia minute*, numerous, scattered, adnate, *black*, *tuberculate or semiglobose*, *convex*, *immarginate*, internally nigricant; *hypothecium very pale*, *dirty-clouded*; *hymenium of pale bluish nigrescence*, *paraphyses distinct*, *apices nigricant*; *spores* 8, colourless, *oblongo-fusiform*, 1-septate, *small*.

On trees, not unfrequent.

SYN :—Flk. Deut. Lich. 181. (1821.) Nyl. Lapp. Or. 149. Crombie Enum. 69. T. M. Fries Scand. 575.
FIG :—Hepp Sporen t. 4. f. 16.
EXS :—M. & N. 1330. Fries 350. Zw. 89 and 89 C. Anzi It. S. 258. Hepp 16. Fellm. 155.
GEOG. DISTRIB :—E. Lapland, Germany, Italy, Hungary, Switzerland.
BOT. PROV :—15...19.
SCOTLAND :—Loch Katrine ! Lochaber. *Rev. J. M. Crombie.*
IRELAND :—Glencar co. Kerry. *Mr. Carroll.*
Readily distinguished from *L. cyrtella* and *L. anomala* by careful observation and comparison of the above characters and the size and form of the spores .010—.012 mm. long, .003 mm. broad. "Spores .009—.012 mm. long, .002—.003 mm. broad. Gelatina hymenea I blue then vinous." (*Nyl.*) "Spores .009—.015 mm. long .002—.0035 mm. broad. Spermatia slender, straightish or slightly curved .004—5 mm. long." (*T. M. Fries.*)

248. *L. denigrata*, Fr. *fusco-nigricant*, *somewhat virescent*, thin, effuse, *minutely granulose*, (K—C—); *apothecia minute*, *conglomerate*, sessile, livid-black, *convex*, sub-immarginate; *hypothecium colourless*, pale-yellowish; paraphyses distinct, darker, somewhat virescent, apices yellowish-fuscescent; *spores* 8, colourless, *elliptico-oblong* or *ovate*, *straight or slightly curved*, 1-septate, *small*.

On old pales, posts, &c., not unfrequent. 1831.

SYN :—Fr. L. Eur. 270. (1831.) Nyl. Scand. 202.
FIG :—E. Bot. Suppl. 2711. Hepp Sporen t. 4. f. 14.
EXS :—Hepp 14. Anzi It. S. 256. Zw. 394.
GEOG. DISTRIB :—Switzerland, Italy, Germany, Scandinavia.
BOT. PROV :—2, 3...5...10.
ENGLAND :—Esher, Surrey; Henfield and Boxgrove, Sussex. *Mr. Borrer.* (1851.) Farndale ! near Marskee, Cleveland. *Mr. Mudd.* Shermanbury ! Sussex. *Mr. Larbalestier.* Oaksey near Cirencester. *Mr. Joshua.* Wheatfield Park ! Oxfordshire. *Mr. Larbalestier.* near Treflach Hall ! Shropshire, and Penzance ! *Rev. T. Salwey.* Caer Caradoc ! Shropshire. Norton Camp ! Berwick ! near Shrewsbury.
"Gelatina hymenea I blue. Spores .009—.013 mm. long, .0025—.004 mm. broad." (*Nyl.*) Spores .01—.011 mm. long, .003 mm. broad.

249. *L. pulverea*, Borr. *pale-greyish-green*, minutely *granuloso-pulverulent or mealy*, soft, effuse, indeterminate, moderately thick, (K yellow C—); *apothecia* rather large, scattered or conglomerate, *adnato-sessile*, *black*, *internally pale*, plane, with a *paler livid slightly*

*raised margin*, eventually convex and immarginate ; *hypothecium* colourless ; hymenium narrow, seated on a pale-yellow thin stratum which rests on a white opake stratum, subtended by a lateral yellow excipulum ; paraphyses distinct,apices nigricant ; *spores* 8, colourless, oblong or elliptico-oblong, 1-septate, *large*.

On trees, mountain-ash, alder, rare. 1807.

SYN :—Borrer in E. Bot. Suppl. 2726. (1831.) Mudd Man. 180.
FIG :—E. Bot. Suppl. 2726.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...7...12...15...19...26.
ENGLAND :—New Forest. *Mr. Lyell.* Keswick, ! Cumberland. *Mrs. Stanger.* near Danny, Sussex. *Mr. Larbalestier.* Ardingley, Sussex. *Mr. W. Joshua.*
SCOTLAND :—Aberfeldy ! Glen Falloch near Inverarnan. *Dr. Holl.* Loch Lomond. *Rev. J. M. Crombie.*
IRELAND :—Glengariff. *Adm. Jones.* Old Dromore. *Dr Taylor.* Cromaglown, Killarney. *Dr. Moore.* near Killarney. *Mr. Carroll.* Letterfrack ! Lough Muck ! co. Galway. *Mr Larbalestier.*
WALES :—Capel Cwm, Barmouth ! *Rev. T. Salwey & Mr. Borrer.* Llanbedr Valley. *Mr. Holmes.* Glyn ! near Capel Curig. Trefriw ! Capel Arthog ! Gaer Ditches !

Not unlike the *commutata* form of *L. Lightfootii*, but differs in size and shape of the spores and chemical reaction. "Spores .003—.0035 in. long, by .00125 in. broad." (*Mudd.*) Spores .016—.018 mm. long, .0075—.0085 mm. broad.

†† *Apothecia livido-fuscous to black.*

250. *L. lenticularis*, Ach. *brownish* or *nigricant* or *cinereo-fuscescent*, *thin*, *indeterminate* or *evanescent*, (K—C—) ; *apothecia* livido-fuscous, rufo-fuscous, black or fuscous-black, *small*, plane, marginate ; *hypothecium colourless* ; spores 8, colourless, oblong or lineari-oblong, 1-septate, small.

On mountain and maritime rocks, not unfrequent.

SYN :—Ach. Syn. 28. (1814.) Nyl. Scand. 242.
GEOG. DISTRIB :—Switzerland, Germany, Italy, N. Africa, Denmark, Sweden, Norway, Finland
BOT. PROV :—7...(19—30)...31.
"Spores .007—.011 mm. long, .003—4 mm. broad." (*Nyl.*) "Spores .006—.011 mm. long, .002—4 mm. broad." (*T. M. Fries.*)

forma *vulgaris*, (Korb.) *albido-cinerascent* or *cinerascent*, *sub-pulverulent*, scarcely granulose, thin, indeterminate ; *apothecia rufo-fuscous or fuscous-black.*

On rocks, frequent.

SYN :—Korb. Par. 144. T. M. Fries Lich. Scand. 568.
EXS :—Zw. 272. Anzi Ven. 67. Ital. S. 254. Langob. 120.
BOT. PROV :—2...7...15...26.
ENGLAND :—Beachy Head ! *Mr. Holmes.*
SCOTLAND :— Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND :—Lough Corrib ! *Mr. Larbalestier.*
WALES :—Eglwyseg rocks ! Nant Gwynant !

forma *pulicaris*, (Mass.) *pallido-fuscescent*, *smooth*, thin, *continuous*, indeterminate ; *apothecia nigro-fuscous or rufescent*, small.

On rocks, not unfrequent.

SYN :—Mass. Ric. 136. (1852.)
FIG :—Mass. Ric. fig. 267.
EXS :—Anzi Ven. 69.
BOT. PROV :—7...26.
IRELAND :—Twelve Pins ! Westport ! Doughruagh ! near Lettermore ! Connemara. *Mr. Larbalestier.*
WALES :—Trefriw ! Holyhead Mountain !

forma *rimoso-areolata*, Leight. *darkly-cinereous*, tartareous, *thickish*, *rimoso-areolate or diffract*, areolæ large, plane or flattish, uneven, (K—C—); apothecia black, small, subinnato-sessile or sessile, margin thin soon obliterated; hypothecium colourless; paraphyses distinct but cohærent, apices blackish; spores 8, colourless, oblong or lineari-oblong, sometimes subacute at each apex, 1-septate; gel. hym. I vinous.

On rocks, rare. 1875.

BOT. PROV :—26.
IRELAND :—Lettermore! near Rinvyle, co. Galway! *Mr. Larbalestier.* (1875.)

forma *chloropoliza*, Nyl. *cinereo-virescent*, thin, unequal or rugulose; apothecia large.

On maritime rocks, not common.

SYN :—Nyl. Armor. in Bull. Soc. Bot. Fr. 8. p. 758. (1861.)
GEOG. DISTRIB :—France.
BOT. PROV :—15...24...31.
SCOTLAND :—Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Kilkee co. Clare. *Mr. Carroll.*
CHANNEL ISLANDS :—Boulay Bay, Jersey. *Mr. Larbalestier.*

forma *nigricans*, Arn. *nigricant*, thin, *furfuraceous*, *diffract; apothecia large*, *black*.

On rocks and mortar, rare. 1875.

SYN :—Arnold in Flora 1860. p. 74.
EXS :—Anzi Venet. 175.
GEOG. DISTRIB :—Sweden, Germany, Italy.
BOT. PROV :—7
WALES :—On the mortar of Pont Dysynni near Towyn! (1875.)
"Spores 0.009—11 mm. long, 0.003 mm. broad." *(Arnold.)*

forma *rhyparocarpa*, Nyl. said to be found on rocks in Craig Tulloch, Scotland, by *Rev. J. M. Crombie* (1870), but I have seen neither diagnosis nor specimen.

forma *acrustacea*, Hepp. *thallus evanescent or altogether obliterated; apothecia black*, variable in size, moderate.

On rocks.

SYN :—Arnold in Flora 1858. p. 502.
EXS :—Arn. 471.
BOT. PROV :—7...26.
IRELAND :—Rinvyle! Doughruagh! co. Galway. *Mr. Larbalestier.*
WALES :—Crib Coch! Snowdon.

forma *oxydata*, Leight. *ferrugineo-ochraceous;* apothecia black, minute.

On rocks.

BOT. PROV :—26.
IRELAND :—Near Letterfrack! co. Galway. *Mr. Larbalestier.*

forma *nigro-clavata*, Nyl. evanescent; apothecia small, superficial, convex or plane, internally cinerascent in the middle; *spores* 8, pale-yellow, oblongo-cylindrical, *simple*.

On trees, cherry, elm.

SYN :—Nyl. in Bot. Not. 1853. p. 160. Scand. 242. Crombie Enum. 91.
GEOG. DISTRIB :—France, Germany, Russia, Algeria.
BOT. PROV :—2...24.
ENGLAND :—Shanklin, Isle of Wight. *Dr. Holl.*
IRELAND :—Rostellan co. Cork; near Limerick. *Mr. Carroll.*

"Spores .010—9 mm. long, .004—2 mm. broad. Paraphyses thick, excessively nigro-clavate at the apices. Hypothecium excipulare fuscum." (*Nyl.*)

forma *minor*, Cromb. smaller.

SYN :—Crombie En. 91.
BOT. PROV :—19.
IRELAND :—Turk Mountain, Killarney.

251. *L. rupicola*, Nyl. *glaucous*, thin, opake, *subrimulose*; *apothecia livid or livido-fuscous, pallescent*, plane, marginate, *generally with a spurious thalline margin; hypothecium colourless;* spores 8, colourless, oblong or sublineari-oblong, 1-septate; paraphyses distinct, cohærent, apices colourless; epithecium sublutescenti-granulose.

On moist micaceo-schistose rocks. 1877.

SYN :—Nyl. in Flora 1877. p. 228.
BOT. PROV :—26.
IRELAND :—Dawros Cliffs! Galway. *Mr. Larbalestier.* (1877.)
"Spores .010 -11 mm. long, .004 mm. broad. Gelatina hymenea I blue then vinous-red. Scarcely specifically different from *L. cyrtella*, with which it agrees in the spermatia. May be regarded as a Lecanora, but far removed from *L. erysibe.*" (*Nyl.*) Spores .012—.015 mm. long, .005—6 mm. broad.

252. *L. anomala*, (Fr.) *albo-cinerascent, sub-granuloso-pulverulent*, thin, sometimes evanescent, (K—C—); *apothecia livido-rufous* or *blackish, adnate*, plane, margin thin, at length convex and margin obliterated, *internally colourless; hypothecium colourless; hymenium colourless;* paraphyses concrete, *apices pale; spores* 8, colourless, oblong or elliptical, 1-septate, *large.*

On trees, ash, holly, not common.

GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—3...10...26.
ENGLAND :—Near Ayton; Airyholme! Cleveland. *Mr. Mudd.* Hickmore, Fen Wood; Mile End near Colchester; Felix Hall Park; Kelvedon, Pod's Wood, Messing, Essex. *Mr. Varenne.*
IRELAND :—Near Lough Muck, co. Galway. *Mr. Larbalestier.*
Form and size of spores distinguish it from *L. tricolor* and *L. globulosa.* The apothecia moistened with K and C remain dark and do not become transparent as in *L. cyrtella.* Spores .011 -.014 mm. long, .004—.005 mm. broad.

253. *L. tricolor*, (With.) *whitish*, very thin, unequal or obsolete or *sub-granuloso-rugose, effuse, (K yellow C orange); apothecia carneo-fuscous* or *livido-fuscescent* or *nigricant*, plane, *margin thin, paler; hypothecium colourless*, lateral excipulum very pale-brownish; spores 8, colourless, oblongo-ellipsoid or *oblongo-fusiform*, 1-septate.

On oak and pine, ash, hawthorn, sycamore, trees, common. 1796.

SYN :—With. Arr. 4. 23. (1716.) Nyl. Scand. 207. *Lichen Griffithii*, Sm. *Biatora mixta*, Fr. L. E. 268. Mudd Man. 176.
FIG :—E. Bot. 1735. Hepp Sporen t. 85. f. 738.
EXS :—Bohl. 119. Zw. 82. Arn. 216. Hepp 738. Korb. 278. Leight. 70.
GEOG. DISTRIB :—Sweden, Italy, Germany.
BOT. PROV :—2, 3, 4, 5...7, 8, 9, 10, 11...15...19...25...30, 31.
ENGLAND :—Durham. *Rev. J. Harriman.* Yarmouth. *Mr. Turner.* Sussex! *Mr. Borrer.* Lodge near Ludlow! Woodhill! Oswestry, Shropshire. *Rev. T. Salwey.* Haughmond Hill! Shropshire. *Prof. Churchill Babington.* Cliffrigg! Oggery Hill! Airyholme Wood! Cleveland. *Mr. Mudd.* New Forest and Epping Forest. *Rev. J. M. Crombie.* Malvern; Isle of Wight. *Dr. Holl.* Stoke Wood, Exeter. *Mr. Parfitt.* near Twycross, Leicestershire. *Rev. A. Bloxam.* near Colchester, Essex. *Mr. Varenne.* Ragley Wood, Warwickshire. *Rev. W.*

*S. Rufford.* Joyden's Wood, Halstead, Ightham, Hythe, Kent. *Mr. Holmes.* Park, Cirencester. *Mr. W. Joshua.* Parkgate! Cheshire; Nesscliffe Hill! Haughmond Hill! High Rock near Bridgnorth! between Hopton and Great Ness! Llanforda! Downton Castle Woods! Shropshire.

SCOTLAND :—Loch Lomond. *Rev. J. M. Crombie.* Glen Falloch. *Dr. Holl.*

IRELAND :—Near Cork and Glenstal, co. Tipperary. *Mr. Carroll.* near Belfast. *Mr. Templeton.* near Dunkerron. *Dr. Taylor.*

WALES :—Garn near Denbigh. *Mr. Griffith.* (1796.) Drwsynant! Builth! Tremadoc!

CHANNEL ISLANDS :—St. Peter's Wood! Jersey. *Mr. Larbalestier.*

"Spores .0025—.003 in. long, by .0075 in. broad. Spermatia cylindrico-arcuate, more or less attenuated towards the extremities." (*Mudd.*) "Spores .010—20 long, .035—.045 mm. broad." (*Nyl.*) "Spores .008—16 mm. long, .003—4 mm. broad." (*T. M. Fries.*) Spores .011—.013 mm. long, .003—4 mm. broad.

254. *L. prasiniza*, Nyl. *dirty-virescent, subgranulato-furfuraceous*, scattered, indeterminate; *apothecia livido-fuscous* or blackish, minute, *innato-sessile; hypothecium colourless; hymenium violaceo-blackish;* paraphyses scarcely distinct, apices colourless; spores 8, colourless, oblongo-ellipsoid or lineari-oblong, simple, or 1-septate, minute.

On semiputrid trunks, rare.

SYN :—Nyl. in Flora 1874. p. 312.

GEOG. DISTRIB :—Finland.

BOT. PROV :—16.

SCOTLAND :—Barcaldine! Lorn, Argyleshire. *Rev. J. M. Crombie.*

"Spores .011—.012 mm. long, .004 mm. broad." (*Nyl.*)

255. *L. atropurpurea*, Schær, *greenish-grey, granuloso-leprose*, effuse, (K—C—); *apothecia livido-carneous or livido-rufous, at length fusco-nigricant, (reddish-brown when moist,)* minute, scattered, sessile, plane or convex, *margin thin, entire, darker than the epithecium; hypothecium pale, colourless or pale yellowish; excipulum externally fuscous;* paraphyses cohærent, apices fuscescent; spores 8, colourless, elliptical or ovate, 1-septate.

On trees, not common.

SYN :—Schær. Spicil. 165. (1833.) Enum. 140. Crombie Enum. 64. T. M. Fries L. Scand. 565. Korb. Par. 142. Mudd Man. 178.

FIG :—Mass. Ric. f. 265.

EXS :—Hepp. 277. (*fide* T. M. Fries.) Schær. 206. (in part). Zw. 343. 371. Arn. 76. 595.

GEOG. DISTRIB :—Switzerland, Germany, Denmark, Sweden, Norway, Finland.

BOT. PROV :—2...7...19...31.

ENGLAND :—New Forest. *Rev. J. M. Crombie.* Hurstpierpoint! near Tunbridge Wells! *Mr. Borrer.*

IRELAND :—Killarney and Glengariff. *Adm. Jones.* Turk Dinis Island and Cromaglown, Killarney; Glenbower Wood, Killeagh. *Mr. Carroll.*

WALES :—Capel Arthog! Gwydir woods! Bettws-y-coed.

CHANNEL ISLANDS :—Rozel, Jersey! *Mr. Larbalestier.*

"Spores .010—14 mm. long, .005—7 mm. broad. Spermatia short, sub-cylindrical or slightly incrassate at both ends, straightish or slightly curved." (*T. M. Fries.*) Gel. hym. I blue then deep-vinous-red or brown. Spores .011—.015 mm. long, .005—.007 mm. broad. The apothecia when moistened become reddish-brown and transparent from the pale hypothecium, with the margin dark-fuscous, thus distinguishing it from *L. Laureri*, Hepp.

256. *L. atropurpurascens*, Nyl. "Somewhat similar to *L. atropurpurea*, Schær., but differing amongst other characters in having gel. hym. I intensely and persistently bluish." (*Nyl.*)

On aged oaks. 1868.

SYN :—Nyl. in Flora 1873. p. 289—300.
BOT. PROV :—2
ENGLAND :—Near Ministeed in New Forest, [Hants. *Rev. J. M. Crombie.* (1868.)
No specimen has been seen by me.

257. *L. spodiza*, Nyl. *dark-greyish*, thin, subopake, *minutely granulated, or inspersed* with *greyish-green minute granules* (K—C tawny red) ; *apothecia livid-grey or livid-pale*, slightly convex, immarginate, colourless within ; *spores* 8, *colourless, oblong, frequently subcurved, and sometimes obsoletely or spuriously* 1-*septate ; epithecium sordid ;* paraphyses not very well discrete ; *hypothecium colourless ;* gelatina hymenea I bluish.

On old fir pales, rare. 1873.

SYN :—Nyl. in Flora 1874. p. 9.
BOT. PROV :—15.
SCOTLAND :—About Killin. *Rev. J. M. Crombie.* (1873.)
"Allied to *L. denigrata*, but distinct. Spores .011—17 mm. long, .0025—.0035 mm. broad." (*Nyl.*)

258. *L. hemipoliella*, Nyl. "Forsitan sub-species *L. denigratæ*, thallo vix ullo visibili ; apotheciis parvis lividis vel pro parte pallidis ; sporæ vulgo 1-septatæ, long, .008—.011 mm. crass. .003 mm. ; epithecium K leviter violaceo-dissolutum." Nyl. in Flora, 1875, p. 11.

No specimen has been seen by me.

var. *semialbula*, Nyl. whitish or livid-whitish, thin, slightly rimuloso-areolate ; spores 2—4—nucleated, septa discernible by K.

On decorticated wood, rare. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 89. (1875.)
BOT. PROV :—17.
SCOTLAND :—Near Altnaharra co. Sutherland. *Dr. Stirton.* (1875.)

††† *Apothecia yellow.*

259. *L. luteella*, Nyl. *white*, very thin or albo-macular ; apothecia *pale-yellow*, small, margined (or submarginate, *young ones gyalectoid*), *colourless within ;* spores 8, colourless, oblong, or oblongo-fusiform, 1-septate ; thecæ often thick and solid at the apices ; paraphyses slender.

On calcareous rocks, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 6. Crombie En. 73.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...28.
ENGLAND :—Upperton, Eastbourne. *Mr. Roper.*
IRELAND :—Sheepwalk, Armagh. *Adm. Jones.*
"Systematically after *L. erysiboides*, Nyl. Spores .016—23 mm. long, .006—7 mm. broad." (*Nyl.*)

260. *L. littorella*, Nyl. *glauco-virescent*, very thin, *rimulose ; apothecia pale-yellow, biatorine, small*, plane, submarginate ; *hypothecium colourless ; spores* 8, *colourless, oblong*, 1-*septate ;* paraphyses slender, apices colourless.

On shady rocks, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 229.
BOT. PROV :—26.
IRELAND :—Lough Inagh ! Galway. *Mr. Larbalestier.* (1876.)

"Like *L. polytropa*. Spores .008—.012 mm. long, .0035—.0045 mm. broad. Gelatina hymenea I blue then vinous-red." (*Nyl.*) Spores .016 mm. long, .007 mm. broad.

261. *L. Arnoldi*, (Krmphbr.) *whitish*, effuse, tartareo-farinose, (K—C—); *apothecia croceo-ferruginous, minute, sessile*, somewhat *concave with a thick paler margin*, afterwards plano-convex and immarginate; *hymenium yellowish-brown*, paraphyses distinct but cohærent, apices colourless; *hypothecium grumous, pale-yellowish-brown; spores* 8, colourless, *narrowly elliptical*, 1-*septate*.

On calcareous rocks, rare. 1876.

SYN :—Krmphbr. in Flora 1855. p. 72. *Biatorina minuta*, Mass. Ric. p. 137.
FIG: —Hepp Sporen t. 59. f. 507.
EXS :—Zw. 236. Hepp 507. Arn. 75.
GEOG. DISTRIB :—Germany, Sweden.
BOT. PROV :—26.
IRELAND :—Twelve Pins! Connemara. *Mr. Larbalestier*. (1876.)
Gelatina hymenea I violet. Spores .015—.017 mm. long, .005 mm. broad.

262. *L. albocarnea*, Nyl. *whitish*, thin, at length *rimuloso-diffract*, (K—C—); *apothecia pale-yellowish-flesh colour, convex, immarginate*, internally colourless; hypothecium colourless; *paraphyses slender, not fully distinct*, apices colourless; *spores* 8, *colourless, oblong, simple, or obsoletely* 1-*septate, minute*.

On rocks and stone walls, rare. 1876.

SYN : –Nyl. in Flora 1876. p. 234.
BOT. PROV :—26.
IRELAND :—Mwerlan; Lettermore; Ballinahinch, Lough Inagh, Doughruagh! co. Galway. *Mr. Larbalestier*. (1876.)
"Spores .009—.014 mm. long, .003—.0035 mm. broad. Gelatina hymenea I bright-blue then vinous-red." (*Nyl.*) Resembling *L. albidocarnea*, but with different spores.

f. *umbrosa*, Nyl. thallus thicker, tartareous, coarsely areolato-diffract.

IRELAND :—Mwerlan! near Kylemore, Galway. *Mr. Larbalestier*. (1877.)

263. *L. luteorosella*, Nyl. *dirty-yellowish, tartareous*, thin, *rimulose, furfuraceous; apothecia reddish-flesh-colour*, scattered, convex, immarginate; spores 8, colourless, *lineari-subfusiform*, 1-*septate*.

On rocks, very rare. 1877.

EXS :—Lojka Transyl. 3210 and 3261.
BOT. PROV :—26.
IRELAND :—Twelve Pins! *Mr. Larbalestier*. (1877.)

264. *L. subdiluta*, Leight. *dark-dirty-sea-green*, thin, effuse, *continuous*, very slightly rimulose; *apothecia pale, waxy*, minute, *elevato-sessile; epithecium pale-brown*, plane or concave, *surrounded by a thickish, pale, waxy, elevated margin; hypothecium colourless; paraphyses indistinct*, conglutinate, apices brown; *spores* 8, *colourless, oblong*, 1-*septate*, minute, somewhat constricted in the middle.

On rocks, rare. 1872.

SYN :—Leight. in litt. 1872. May. Linn. Trans. 2d. ser. 1. p. 145.
FIG :—Linn. Trans. l. c. tab. 22, fig. 13—16.
BOT. PROV :—31.

CHANNEL ISLANDS:—Boulay Bay! Jersey. *Mr. Larbalestier.* (May 1872.) Spores .0185—.02 mm. long, .0085 mm. broad.

265. *L. lutea*, (Dicks.) *albescent*, effuse, very thin, granuloso-leprose or evanescent, (K—C—); *apothecia bright-carneo-fulvescent*, rather large, scattered, more or less *concave, then plano-convex, margin* entire, thin, smooth, *paler*, flexuose; *hypothecium thick, colourless*, carnose; *spores* 8, colourless, *fusiformi-oblong*, 1-septate.

On mosses and trees, not common. 1785.

SYN:—Dicks. Br. Crypt. 1. 11. (1785.) Nyl. Scand. 192. Mudd 177.
FIG:—E. Bot. 1263. Leight. Br. Ang. Lich. t. 14. f. 3.
EXS:—Hepp 501. Larbal. 29. Zw. 331. Wright Cuba. 177. Korb. 277. Arn. 98.
GEOG. DISTRIB:—France, Germany, Austria, Bavaria, Cuba, Ceylon, Lapland, Norway, America, Sandwich Islands.
BOT. PROV:—1, 2...5...7...19...28...30, 31.
ENGLAND:— . *Mr. Dickson.* (1785.) Penzance! Llanforda! near Oswestry. *Rev. T. Salwey.* Woodmancote! Sussex. *Mr. Borrer.* Launceston; near Lyndhurst, New Forest. *Rev. J. M. Crombie.* Danny, Sussex. *Mr. Larbalestier.* Ditcham Cross, S. Devon; Camelford, Cornwall. *Dr. Holl.* Countess Weir Topsham, Devon. *Mr. Parfitt.* Lydford, Devon. *Mr. Holmes.*
IRELAND:—Ardrum! Castlemary! near Cork. *Mr. Carroll.* Killarney. *Mr. Hardy.* Luggelaw and Glengarriff. *Adm. Jones.* near Bantry. *Miss Hutchins.* near Belfast. *Mr. Templeton.* Askew Wood and Duukerron. *Dr. Taylor.* Glenarm. *Dr. Moore.*
WALES:—Near Bangor. *Mr. Turner.* near Cwm Bychan. *Mr. Holmes.* Llyn Gwernan! Cader Idris!
CHANNEL ISLANDS:—Quenvais; Rozel! Jersey. *Mr. Larbalestier.*
"Paraphyses conglutinate. Spores .0025 in. long by .0005 to .00075 in. broad." *(Mudd.)* Spores .0145—.016 mm. long, .0035 mm. broad.

266. *L. cyrtella*, Ach. *pale* or *whitish* or *cream-coloured*, very thin, unequal or evanescent, (K—C—); *apothecia pale-tawny-yellow* or *livido-rufescent* or *rufescent*, plane or convex, small, *generally with more or less of a pseudothalline white margin, internally colourless;* hypothecium colourless; *hymenium colourless*, paraphyses concrete, *apices pale*; spores 8, colourless, lineari-oblong, 1-septate, rather large.

On trees, not unfrequent; on rocks, rarer. 1810.

SYN:—Ach. Meth. 67. (1805.) Syn. 39. Nyl. Scand. 206.
FIG:—E. Bot. 2155.
EXS:—Schær. 473. Arn. 48. 501. Anzi Langob. 336. Rabh. 174. Hepp 18. Fellm. 161. Zw. 275. Mass. 132.
GEOG. DISTRIB:—Switzerland, Bavaria, Lombardy, Hungary, Germany, Italy, E. Lapland.
BOT. PROV:—2...4, 5, 6...8...10...24...26...31.
ENGLAND:—Yarmouth. *Mr. Turner.* 1810. Sussex! *Mr. Borrer.* Airyholme Wood! Kildale! Cleveland. *Mr. Mudd.* Gopsall! Leicestershire. *Rev. A. Bloxam.* Beechborough, Sibertswold, Sandgate, Kent. *Mr. Holmes.* Cirencester! *Mr. Joshua.*
IRELAND:—Ballynagarda; Mountshannon, Limerick. *Mr. Carroll.* Rinvyle! co. Galway. (saxicole) *Mr. Larbalestier.*
WALES:—Goodwick Bay! Pembrokeshire (saxicole).
CHANNEL ISLANDS:—*(saxicole)* Ann Port, Jersey. *Mr. Larbalestier.*
The apothecia when moistened with K and subsequently with C become pale and transparent in the disk with a very thin greenish line around the circumference. Spores .0115—.015 mm. long, .004 mm. broad. Gelatina hymenea I blue.

267. *L. pilularis*, Korb. *pale-glauco-virescent, minutely-granulato-leprose*, effuse (K—C—); *apothecia yellowish-flesh-colour*, ses-

sile, *convex*, *subimmarginate*; *hypothecium colourless* or very pale-yellowish; paraphyses cohærent, apices colourless; *spores* 8, *colourless*, *ellipsoid*, 1-*septate*:

On old ivy, rare. 1877.

SYN:—Körb. Par. 136. (1865.)
FIG:—Hepp Sporen t. 85. f. 739.
EXS:—Hepp 739. Arn. 323. Zw. 369. 377. Körb. 187. Wright 198. Spruce 211.
GEOG. DISTRIB:—Germany, Hungary, Cuba, Amazons.
BOT. PROV:—26.
IRELAND:—Glendalough! Galway. *Mr. Larbalestier.* (1877.)
K has no effect in tinging the apothecia. Spores .012—.013 mm. long, .004—5 mm. broad.

268. *L. fallax*, (Hepp.) *cinereo-virescent*, thin, *subleprose*, effuse; apothecia *flesh-colour-yellow*, somewhat convex or convex, *immarginate* (young apothecia with an obtuse margin), *colourless within*; spores 8, colourless, oblong or oblongo-fusiform, 1-septate; paraphyses slender or indistinct; epithecium, hymenium, *and hypothecium colourless*; gelatina hymenea blue, then violet, with iodine. (K turns apothecia reddish.)

On elms, rare. 1865.

SYN:—Hepp Flecht. Europ. 505. (1860.) *L. chlorotiza*, Nyl. in Flora 1866. p. 85. Crombie En. 70.
FIG:—Hepp Sporen t. 58. f. 505.
EXS:—Hepp 505. Wright Cuba 197. Schær. 207. Zw. 277. Arn. 74.
GEOG. DISTRIB—Germany, Switzerland, Pyrenees, Italy, Bavaria, Cuba.
BOT. PROV:—1, 2.
ENGLAND:—Leigh Woods! Clifton, co. Somerset. *Mr. Larbalestier.* (1865.) near Shanklin, Isle of Wight. *Dr. Holl.*
"Spores .009—.012 mm. long, .002—.003 mm. broad." (*Nyl.*) Spores .012—.013 mm. long, .003 mm. broad.

269. *L. Ehrhartiana*, (Ach.) *albido-flavescent*, effuse, granulato-rugose or evanescent; *apothecia pale-yellow*, small, numerous, *adnate*, plane, margin thin, afterwards convex and immarginate; *hypothecium colourless*; *spores* 8, colourless, *lineari-* or *fusiformi-oblong*, 1-septate, small.

On exposed old timber, barns, &c., not common. 1803.

*Cliostomum corrugatum*, Fr. (Leight. Angioc. Lich. p. 69. t. 30. f. 1.) constitutes the spermogonia of this lichen.
SYN:—Ach. Prodr. 39. (1798.) Syn. 47. Nyl. Scand. 195. Mudd Man. 176.
FIG:—E. Bot. 1136. Leight. Angioc. Lich. t. 30. f. 2.
EXS:—Hepp 497. Zw. 91. Reich. and Schub. 97. Stenh. 134. Schær. 326. 192. Leight. 410.
GEOG. DISTRIB:—Switzerland, Germany, Sweden, Lapland, Finland, Italy.
BOT. PROV:—1, 2, 3, 4, 5.
ENGLAND:—Acle, Norfolk. *Mr. Turner.* (1803.) Livermere! Suffolk; near Cotteshall! *Mr. Borrer.* Tilgate Forest, Sussex. *Mr. Larbalestier.* Devon. *Mr. Parfitt.* Messing, Essex. *Mr. Varenne.* Great Alne, Warwickshire. *Rev. W. S. Rufford.* Cambridge. *Rev. R. Relhan.* near Colchester, Essex. *Rev. J. M. Crombie.* Little Malvern. *Mr. Lees.* Pembridge! Herefordshire.
"Spores .002—.003 in. long by .00075 in. broad. Spermatia lineari-oblong or ellipsoid, .0005—.00075 in. long by .0002 in. broad." (*Mudd.*) "Spores .008—.011 mm. long, .0025—.0035 mm. broad." (*Nyl.*) "Spores .007—11 mm. long, .0025—35 mm. broad." (*T. M. Fries.*) Spores .007—.01 mm. long, .0015—.0025 mm. broad.

270. *L. Bouteillei*, (Desmaz.) *albido-subvirescent*, *filmy*, thin, effuse, *minutely granulose*, (K—C—); *apothecia pale-yellow-flesh-colour*, minute, scattered, *adnato-sessile*, plane, margin thin,

paler, entire or crenato-flexuose, (K—); *hypothecium colourless;* spores 8, colourless, ellipsoid, 1-septate, minute.

On leaves of box, fir and elm bark, rare. 1868.

SYN :—*Lecanora Bouteillei*, Desmaz. Cr. Fr. ed. 2. 1195. (1847.) Nyl. Lapp. Or. 152.
EXS :—Arn. 331. Rabh. 856.
GEOG. DISTRIB :—France, Germany.
BOT. PROV :—2.
ENGLAND :—Danny Sandfield! Sussex. *Mr. Larbalestier.*
"Spores .008—.010 mm. long, .003—4 mm. broad. Paraphyses slender, irregular; gelatina hymenea I blue then dirty-lutescent, the apices of the asci remaining blue." (*Nyl.*)

271. *L. erysiboides*, Nyl. *green, leprose*, thin, nearly indeterminate, almost evanescent, (K—C—); *apothecia testaceo-rufous*, small, sub-convex, immarginate, opake; *hypothecium colourless; spores* 8, colourless, *ovoid, apically obtuse*, 1-*septate;* paraphyses indistinct.

On old trunks and wood in moist shady places, rare. 1870.

SYN :—Nyl. in Sallsk. pro. F. & Fl. F. Notis. 4. (n. ser. 1.) p. 232. (1859.) Scand. 208.
EXS :—Fellm. 156. Arn. 280.
GEOG. DISTRIB :—Sweden.
BOT. PROV :—1, 2...15.
ENGLAND :—Devon; Isle of Wight. (1870.) (*forma sordidescens*, Nyl.) New Forest near Lyndhurst! *Rev. J. M. Crombie.*
SCOTLAND :—(*f. pallida*, Nyl.) Lake Katrine! *Rev. J. M. Crombie.*
"Spores .007—.010 mm. long, .0035—.0045 mm. broad. Gelatina hymenea I blue then dirty-vinous-red." (*Nyl.*) "Spores .007—.010 mm. long, .003—.005 mm. broad." (*T. M. Fries.*)

272. *L. subsphæroides*, Nyl. *whitish*, thin, *areolato-rimose, rugulose; apothecia pale-reddish*, margined, at length convex, margin excluded, moderate; *hypothecium colourless;* spores 8, colourless, ellipsoid or oblongo-ellipsoid, 1-septate; paraphyses not discrete; gelatina hymenea I bluish, and thecæ violet.

On young beech trees, rare. 1873.

SYN :—Nyl. in Flora 1873. p. 289—300.
BOT. PROV :—2.
ENGLAND :—Near Lyndhurst in New Forest. *Rev. J. M. Crombie.* (1873.)
"Spores .014—17 mm. long, .006—7 mm. broad." (*Nyl.*)

273. *L. diluta*, (Pers.) *virescent, leprose*, very thin, or evanescent, (K—C—); *apothecia pale-rufous-yellow* or *whitish-flesh-colour, minute*, numerous, scattered, *concave*, almost urceolate, *margin paler*, smooth, thickish, *waxy*; hypothecium colourless; spores 8, colourless, elliptico-oblong, 1-septate.

On bases of pine trees, frequent. 1808.

SYN :—*Peziza diluta*, Pers. Syn. 668. (1801); *Lichen pineti*, Schrad. in Ach. Meth. 68; *Biatorina pineti*, Mass. Ric. 135.; Körb. Syst. 189; Par. 136; Mudd Man. 176. *Biatorina diluta*, Th. Fr. Lich. Arct. 185; *Lecidea pineti*, Ach. Syn. 41. Nyl. Scand. 191. Mudd Man. Leight. Lich. Fl. G. B. 317.
FIG :—E. Bot. 1863. two lower fig.
EXS :—Zw. 83. Mudd 145. Hepp 136. Nyl. 56. Schær. 218. Leight. 89. Rabh. 906. Reich. and Shcub. 126.
GEOG. DISTRIB :—Germany, Bavaria, France, Switzerland, Sweden, Finland, America, Hungary.
BOT. PROV :—2...4, 5...8...10...19...22...24, 25...28...30, 31.
ENGLAND :—Cossey near Norwich. *Sir W. J. Hooker.* (1808.) Wood east end

of Llanforda Pool! Oswestry. *Rev. T. Salwey.* Twycross! Gopsall! Leicestershire. *Rev. A. Bloxam.* Cliffrigg! Cleveland. *Mr. Mudd.* near Brighton, Sussex. *Mr. Larbalestier.* Wapley Hill! Herefordshire; Round Hill! near Shrewsbury. Llanforda!

IRELAND :— Near Larne and Belfast. *Dr. Moore.* Armagh. *Adm. Jones.* near Cork; near Limerick co. Clare; Baltinglass, Wicklow; Glenville, Cork; Glenstalk, Tipperary. *Mr. Carroll.*

CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*

"Spores .002 in. long by .0005 in. broad." *(Mudd.)* "Spores .009—.010 mm. long, .003—4 mm. broad." (*Nyl.*) Spores .009—.012 mm. long, .003—4 mm. broad. Gelatina hymenea I very pale-blue.

forma *leucostigma*, Leight, apothecia quite *pale, white and waxy*, numerous, scattered or conjugate, *very minute.*

On elm (Ulmus montana), Rallt Hill! near Buttington and Welshpool, Montgomeryshire. (1875.)

*D. Spores* 1-3-*septate (sometimes simple.)*

274. *L. subviridescens*, Nyl. *virescent*, very thin, opake, or obsolete; apothecia *fuscous*, opake or *fusco-livescent*, *convex*, immarginate, *dusky within;* spores 8, colourless, oblong, simple or *1-3-septate;* paraphyses indistinct; epithecium and *hypothecium dusky*; gelatina hymenea blue, then vinous-red with iodine.

On the earth in maritime localities, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 474. Crombie En. 71.
GEOG. DISTRIB :—Europe.
BOT. PROV :—31.
CHANNEL ISLANDS :—Boulay Bay, Jersey. *Mr. Larbalestier.*

"Like *L. viridescens*, Ach. Spores .011—.018 mm. long, .004—.006 mm. broad." (*Nyl.*)

275. *L. subturgidula*, Nyl. *whitish or virescent*, very thin, effuse; apothecia *livid* or pale-dusky-livid, opake, *convex*, immarginate, in section *hypothecium fuscous with a superior albicant stratum;* spores 8, colourless, oblong, simple or 1-3-*septate*; paraphyses indistinct; epithecium white; *hypothecium fuscescent;* gelatina hymenea blue, then often fulvescent with iodine.

On holly, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 343. Crombie En. 72.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...7...26.
ENGLAND :—Near Lyndhurst in the New Forest! *Rev. J. M. Crombie.* (1868.)
IRELAND :—Tullywee Bridge! co. Galway. *Mr. Larbalestier.*
WALES :—Trefriw!

"Approaches *L. aprochroeidia*, Nyl. Spores .008—.014 mm. long, .003—.004 mm. broad." (*Nyl.*) Spores .0125—.013 mm. long, .003—.004 mm. broad.

276. *L. Caradocensis*, Leight. *dull-grey-greenish-olive*, cartilaginous, effuse, rimoso-areolate, *granulato-verrucose*, *scales* minute, adnate, roundish, *convex*, *crimped* or *wrinkled*, more or less minutely crenulate, (K yellow C orange-yellow); *apothecia dull-black*, sessile on the areolæ, more or less imbedded, scattered or confluent, margin thin, flexuose; *hypothecium rufo-fuscous or dark-brown;* excipulum thin, lateral, nigro-fuscous; paraphyses conglutinate, brown, apices fuscous; spores 8, colourless, elliptico-fusiform, 3-septate, (sometimes 1 or 2-septate,) minute.

On fir trees, old palings, &c., frequent. 1854.

SYN :—Leight. Lich. Brit. Exs. 160. (1854.) Ann. and Mag. Nat. Hist. Dec. 1864.
FIG :—Ann. and Mag. Nat. Hist. Dec. 1864. t. 9. f. 6. 7. 10.
EXS :—Leight. 160.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...5...8.
ENGLAND :—Aymestry! Herefordshire. *Rev. J. F. Crouch.* north side Gopsall Wood near Twycross, Leicestershire! *Rev. A. Bloxam.* Ombersley! near Worcester; Whippets near North Malvern! *Dr. Holl.* Kelvedon, Mark's Hall, Essex. *Mr. Varenne.* Hendon; Finchley; and Totteridge, Middlesex; New Forest. *Rev. J. M. Crombie.* Totterton, Shropshire. *Rev. T. Salwey.* Chalford! Gloucestershire. Wonham, Surrey. *Mr. Joshua.* Westerham, Kent. *Mr. Holmes.* S. & W. bases of Caer Caradoc! (1854); Meole Brace near Shrewsbury! Eastern base of Wrekin! Haughmond Hill! Shropshire.
Spores .0115—.0155 mm. long, .004—.0045 mm. broad.

277. *L. incompta*, Borr. *cinereo-virescent*, thin, crustaceous, *unequal, sub-granuloso-furfuraceous; apothecia dull-black*, numerous, adnate, plane, margin thin, flexuose; *hypothecium thick, black; spores* 8, colourless, *shortly lineari-cylindrical*, 1-2-3-septate.

On trees, frequent. 1831.

SYN :—Borr. in E. Bot. Suppl. 2699. (1831.) Nyl. Scand. 210. Mudd Man. 184.
FIG :—E. Bot. Suppl. 2699.
EXS :—Leight. 162. Schær. 212. Fellm. 175. 176. Anzi It. S. 260. Bohl. 102. Mass. 317. Zw. 335. Körb. 283.
GEOG. DISTRIB :—Switzerland, Italy, Germany, E. Lapland, Denmark, Sweden.
BOT. PROV :—1, 2, 3 ..5...10...24...31.
ENGLAND :—Shermanbury and Hurstpierpoint! Sussex. *Mr. Borrer.* (1831.) Kildale! Yorkshire. *Mr. Mudd.* The Lodge near Ludlow! *Rev. T. Salwey.* Danny, Sussex. *Mr. Larbalestier.* near Worcester; Notter Bridge near Saltash, Cornwall. *Dr. Holl.* Whitstone Hill; Stoke Wood; Dunsford, Devon. *Mr. Parfitt.* Braxted, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* Barnsley Park near Cirencester. *Mr. W. Joshua.*
IRELAND :—Adare near Limerick! *Mr. Carroll.*
CHANNEL ISLANDS :—St. Martin's, Jersey. *Mr. Larbalestier.*
Spores .021—.025 mm. long, .002—.003 mm. broad.

278. *L. prasinoides*, Nyl. *green*, thin, *sub-granulate* or very thin, *subleprose*, indeterminate; apothecia *pale-flesh-colour*, minute, somewhat plane, obtusely or obsoletely margined (in dry state without margin, but in moist corneo-hyaline), colourless within; spores 8, colourless, *bacillar* or fusiformi-bacillar, 1-3-septate; paraphyses slender, colourless at the apices; *hypothecium colourless;* gelatina hymenea vinous-red with iodine.

On calcareous and sandstone rocks, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 146. Crombie En. 74.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...28.
IRELAND :—Sheepwalk, Armagh. *Adm. Jones.* Dinis in Killarney. *Mr. Hardy.*
"Resembling *L. luteola var. chlorotica*, Ach. but with spores even shorter than in the common *L. bacillifera*, Nyl. Spores .012—.021 mm. long, .0025—.0035 mm. broad." *(Nyl.)*

279. *L. Nœgelii*, (Hepp.) *albido-cinerascent*, thin, filmy or slightly granulose, (K—C—); *apothecia livido-carneous*, sometimes livido-fuscescent, *adnate*, plane or slightly concave, margin thin, afterwards subconvex and immarginate, small; *hypothecium colour-*

*less; paraphyses distinct but cohærent*, apices colourless; *spores* 8, *colourless, elongato-or subfusiformi-oblong, apices obtuse, simple or* 1-2 *or* 3-*septate.*

On trees. 1876.

SYN :—*Biatora*, Hepp Exs. 19. (1853.) T. M. Fries Lich. Scand. 379. *L. sphæroides f. vacillans*, Leight. L. Fl. 2d. ed. p. 336.
FIG :—Hepp Sporen t. 4. f. 19.
EXS :—Hepp 19. Anzi Venet. 58. Anzi Langob. 379. Arn. 600 and 600 b.
GEOG. DISTRIB :—Denmark, Sweden, Norway, Finland, Germany, Lombardy, Italy, Scandinavia, Cuba.
BOT. PROV :—3...26...28.
ENGLAND :—Shiere, Surrey. *Dr. Capron.*
IRELAND :—Banks of Erriff River! Connemara. *Mr. Larbalestier.* (1876.) Armagh Demesne. *Adm. Jones.*
The apothecia when wetted with water display a pale transparent disk, surrounded by a dark circumferential ring. Gelatina hymenea I dark-blue then dirty-darkly-fulvescent. Spores .0145—.0165 mm. long, .004—.0045 mm. broad, generally straight sometimes curved. "Spores .015—22 mm. long, .004—6 mm. broad." (*T. M. Fries.*)

280. *L. albidocarnea*, Nyl. *whitish, thin*, irregular, *rimuloso-diffract*, (K—C—); *apothecia pale-yellowish-flesh-colour, convex, immarginate, large*, internally colourless; hypothecium colourless; *paraphyses slender, distinct*, apices clavato-incrassate, colourless; *spores* 8, *colourless, oblong or oblongo-fusiform*, 1-2 *or* 3 *septate.*

On micaceo-schistose rocks and stone walls, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 459.
IRELAND :—Ballinahinch! co. Galway. *Mr. Larbalestier.* (1876).
"Similar to *L. albocarnea*, Nyl. but of the stirps of L. *sphæroides.* Spores .010—18 mm. long, .0035—.0045 mm. broad. Gelatina hymenea I slightly blue then vinous-red." (*Nyl.*) Spores .013—.022 mm. long, .005 mm. broad.

281. *L. chlorotropoides*, Nyl. "similis *L. albovirellæ*, Nyl." but apothecia testaceo-rufescent with a dark margin; hypothecium pale-violet; excipulum bright-violet; spores 8, colourless, bacillar, simple or 1-3-septate.

On calcareous rocks, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 567.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1877).
"Gelatina hymenea I blue then vinous-red. Spores .014—20 mm. long, .002—3 mm. broad." (*Nyl.*)

E. *Spores* 3-*septate, brown.*

* *Hypothecium dark.*

282. *L. alboatra*, (Hoffm.) *white* or albicant, unequal, *subfarinose*, effuse, sometimes sub-evanescent, (K—C—); *apothecia black, albo-suffused* or naked, *small, adnate*, sometimes spuriously lecanoroid; *hypothecium fuscous;* spores 8, fuscous, ellipsoid, 3-septate, sometimes irregularly muriform.

On various trees and pales, common. 1808.

SYN :—Hoffm. Enum. 30. (1784.) Nyl. Scand. 235. Mudd Man. 218. *Lecidea corticola*, Ach. Syn. 32.
FIG :—E. Bot. 1892. Hepp Sporen t. 17. f. 148.
EXS :—Schær. 445. Hepp 29. 148. Zw. 123. Mudd 191. Nyl. 63. Leight. 64. Anzi Ven. 79. 312. Reich. and Schub. 80. 81.

GEOG. DISTRIB :—Sweden, Germany, Switzerland, Italy, Hungary, Bavaria, France, Africa, N. America.
BOT. PROV :—1, 2, 3, 4, 5, 6, 7...10...15...(19...26...30)...31.
ENGLAND :—Seething, Norfolk. *Sir J. E. Smith.* (1808.) Masham! Yorkshire. *Mr. Mudd.* Lewes! *Mr. D. Turner.* Sussex! *Mr. Borrer.* Oswestry, Shropshire. *Rev. T. Salwey.* near Worcester. *Dr. Holl.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Cambridgeshire. *Rev. R. Relhan.* near Exeter. *Rev. J. M. Crombie.* Eynsford, Brastead, Ightham, Kent. *Mr. Holmes.* Tetsworth! Oxfordshire. *Mr. Larbalestier.* Sapperton, Gloucestershire. *Mr. W. Joshua.* Burton Court! Herefordshire. *Rev. J. F. Crouch.* Montford Bridge! Nobold! Shelton! near Shrewsbury; Worfield! Llanforda! Shropshire.!
SCTLAND :—Killin. *Dr. Holl.*
IRELAND :—Not unfrequent. *Mr. Carroll.* Letterfrack! *Mr. Larbalestier.*
WALES :—Near Dinas Bran, Llangollen! Builth!
CHANNEL ISLANDS :—Jersey, Guernsey. *Mr. Larbalestier.*
"Spores .016—20 mm. long, .007—9 mm. broad." (*Nyl.*) "Spores .003—.004 in. long, .00125—.002 in. broad. Spermatia straight, cylindrical." (*Mudd.*) "Spores .015—22 mm. long, .007—10 mm. broad." (*T. M. Fries.*) Spores .0165—.0185 mm. long, .0085—.0095 mm. broad.

forma *populorum*, Mass. *greyish-white, sub-orbicular, determinate,* unequal or areolato-verrucose, (K—C—); *apothecia* constantly *naked.*

On poplar, not common. 1860.

SYN :—*Diplotomma populorum*, Mass. Ric. 99. Mudd Man. 218. *f. leucoplaca*, Leight. L. Fl. 2d. ed. p. 326. *(non D.C.)*
FIG :—Mass. Ric. f. 201.
EXS :—Nyl. 65. Mass. 289. Zw. 230. Anzi Etr. 33. Mudd 192.
GEOG. DISTRIB :—France, Italy, Germany, Hungary.
BOT. PROV :—10.
ENGLAND :—Near Easby and Carlton, Cleveland. *Mr. Mudd* (1860.)

forma *epipolia* (Ach.) *white,* tartareous, *rimoso-areolate, areolæ* unequal or *swelling; apothecia black, cœsio-pruinose, plane,* at length convex or hemisphærical, *always sessile, proper margin persistent.*

On calcareous rocks and walls, frequent. 1803.

SYN :—Ach. Prodr. 58. (1798.) Syn. 32. Nyl. Scand. 235. Somrft. Suppl. 147. Mudd Man. 219.
FIG :—E. Bot. 1137. Hepp Sporen t. 17. f. 146.
EXS :—Mudd 193. Zw. 229. Mass. 358.
GEOG. DISTRIB :—Egypt, Norway, Germany, Italy.
BOT. PROV :—1, 2, 3, 4, 5...7...10...31.
ENGLAND :—Near Ayton! Cleveland. *Mr. Mudd.* Sussex! *Mr. Borrer.* Oswestry! *Rev. T. Salwey.* Market Dereham Church, Norfolk (1803.) Suffolk. *Mr. Turner.* Malvern Hills. *Dr. Holl.* Ide near Exeter. *Mr. Parfitt.* Kelvedon, Coggeshall, Essex. *Mr Varenne.* Midland Counties. *Mr. Purton.* Sandown Castle near Deal; Plaxtol, Kent. *Mr. Howse.* Kingsland! Shrewsbury.
WALES :—Fishguard! Pembrokeshire.
CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*

forma *margaritacea*, (Ach.) *glaucous-white or pearly, subpulverulent,* tartareous, *unequal, contiguous, subrimose; apothecia black, albo-pruinose,* minute, *immersed,* at first plane with a very thin margin, then hemispherico-convex, immarginate, *with a spurious thallodal margin.*

On calcareous rocks and walls, frequent.

SYN :—Ach. Syn. 32. (1810.) Sommrf. Suppl. 148. Mudd Man. 219.
FIG :—Hepp Sporen t. 17. f. 146.
EXS :—Hepp 146. Nyl. 64. Somrft. 50.
GEOG. DISTRIB :—Hungary, Norway, France, Germany, Pyrenees.
BOT. PROV :—2...5...7...10...20...26,

ENGLAND :—Sussex! *Mr. Borrer.* Pinchingthorp Wood! Cleveland. *Mr. Mudd.* Tong Priory! Shropshire.
IRELAND :—Near Cork! *Mr. Carroll.* near Kylemore! Connemara. *Mr. Larbalestier.*
WALES :—Dolbadarn Castle!

forma *ambigua*, (Ach.) *cinereo-fuscescent*, thin, *rimose; apothecia subimmersed, plane*, when young with thin thallodal margin which at length vanishes, *when adult with proper margin, naked.*

On rocks, not unfrequent. 1871.

SYN :—Ach. Univ. 161. (1810.) Syn. 14. a. Nyl. Scand. 236. T. M. Fries Scand. 608.
EXS :—Arn. 634. Rabh. 900. Hepp 530. Zw. 351. Lojka 2812.
GEOG. DISTRIB :—Germany, Transylvania, Switzerland, Sweden.
BOT. PROV :—5, 6...23...26...31.
ENGLAND :—Llanymynech Hill, Shropshire. (1871.)
IRELAND :—Lettermore! *Mr. Larbalestier.* Portmarnock! Dublin. *Dr. Taylor.*
WALES :—St. David's! Pembrokeshire.
CHANNEL ISLANDS :—Green Island! St. Clement's Bay, Jersey. *Mr. Larbalestier.*

forma *murorum*, (Naeg.) *pale-yellowish-white*, thin, effuse, *continuous, smooth*, plane, *rimose; apothecia black, very minute, deeply immersed, plane, with a very thin scarcely perceptible proper margin, naked.*

On subalpine rocks, rare. 1877.

SYN :—Naeg. MS. in Hepp Exs. 30.
FIG :—Hepp Sporen t. 5. f. 30.
EXS :—Hepp 30.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—26.
IRELAND :—Base of the Doughruagh Mountain! Galway. *Mr. Larbalestier.* (1877.)

283. *L. calcarea*, (Weis.) *white, orbicular*, determinate, *tartareo-farinose, rimuloso-areolate* in the centre, sub-effigurate at the circumference, (K—C—); *apothecia* largish, black, *innate*, plane, cæsio-pruinose, when old *convex, with white thallodal margin*, proper margin black, thin, persistent; *hypothecium fuscous-black;* spores 8, fuscous, narrowly oblong or lineari-oblong, 3-septate.

On calcareous rocks, frequent. 1808.

SYN :—Weis. Cr. Gotting. 40. (1772.) *L. speirea*, E. Bot!
FIG :—E. Bot. 1864.
EXS :—M. & N. 943. Schær. 230. Anzi It. S. 314.
GEOG. DISTRIB :—Italy, Switzerland, Germany, Hungary, Bavaria.
BOT. PROV :—1, 2...7, 8...15, 16.
ENGLAND :—Near Newhaven! Sussex. *Mr. Borrer.* (1808.) The Frith, near Buxton. *Dr. Holl.* Ide near Exeter. *Mr. Parfitt.*
SCOTLAND :—Ben Lawers. *Dr. Holl.* Morrone, Craig Guie, Appin. *Rev. J. M. Crombie.*
WALES :—Llandudno, Great Orme's Head! Eglwyseg rocks!
Spores .018—.02 mm. long, .006 mm. broad.

284. *L. chlorophæa*, Hepp. MS. *tawny* or creamy-white, *verrucose* or *areolato-rimulose*, unequal, scattered or sub-determinate, (K yellow then red); *apothecia* numerous, small, *subinnato-sessile*, black, *slightly pruinose*, plane or convex; *hypothecium dark-brown*; spores 8, fuscous, oblong, 3-septate, irregularly muriform.

On maritime rocks, rare. 1868.

SYN :—Hepp MS. in herb. Arnold!
GEOG. DISTRIB :—Germany, Italy.
BOT. PROV :—6, 7.
WALES :—Aberdovey! North Wales. *Rev. A. Bloxam.* (1868.) North Cliff! Tenby; Manorbeer!

285. *L. deducta*, Nyl. *greenish*, effuse, obscurely *sub-gelatinous*; *apothecia blackish*, small, *usually margined*, reddish in a thin section; hypothecium more obscure in the middle; spores 8, *colourless* or *faintly blackish*, elliptical or oblong, 3-septate; paraphyses indistinct; gelatina hymenea blue, then vinous-red, with iodine.

On old felled holly stumps, very rare. 1869.

SYN :—Nyl. in Flora 1869. p. 410. Crombie in Seem. Journ. Bot. 7. 233. (1869.) Enum. 72.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2.
ENGLAND :—Near to Brockenhurst in New Forest! *Rev. J. M. Crombie.* (1869.)
"Perhaps only a var. of *L. subturgidula*, Nyl. but differing chiefly in the black and marginate apothecia. Spores .010—.013 mm. long, .0035—.0045 mm. broad." (*Nyl.*)

286. *L postuma*, Nyl. *cinerascent*, evanescent; apothecia *black*, rather minute, somewhat plane, marginate, *concolorous within;* hypothecium and epithecium *fuscescent;* spores 6-8, colourless or fuscescent, ellipsoideo-oblong, 3-septate, generally with a few oblique or longitudinal septulæ.

On calcareous stones in gravelly mountain localities, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 345. Crombie En. 87.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.* (1868.)
Possibly a starved variety of *L. petræa*. "Spores .015—.016 mm. long, .006—.007 mm. broad." (*Nyl.*)

287. *L. triphragmia*, Nyl. similar to *L. disciformis* in the thallus (Ky then red) and general habit, but with *spores* 3-*septate*.

On shady rocks and trees in sub-alpine districts, rare. 1870.

SYN :—Nyl. Prodr. 141. (1857.) Scand. 236. Crombie in Seem. Journ. 9. 179.
EXS :—Wright 239.
GEOG. DISTRIB :—Norway, Sweden, Finland, Cuba, Calcutta.
BOT. PROV :—15.
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.* (1870.)
"Spores .025—.034 mm. long, .009—.0011 mm. broad." (*Nyl.*) Spores .022 mm. long, .009 mm. broad.

F. *Spores* 3-*septate, colourless.*

* *Hypothecium dark.*

288. *L. Œderi*, (Web.) *ochraceo-ferruginous, thin, areolate* or *areolato-granulose*, (K—C—); *apothecia* small, umbonate or *generally plicate* or *sub-gyrose, black*, plane, margin thin, flexuose; *hypothecium black; spores* 8, colourless, *oblong*, 3-septate, nucleolate.

On mountain and maritime rocks, frequent.

SYN :—Web. Spicil. 182. (1778.) Ach. Prod. 66. Syn. 22. Nyl. Scand. 234. Mudd Man. 220.
FIG :—Hepp Sporen t. 59. f. 508.
EXS :—Fries L. S. 384. Hepp 508. Leight. 187. Zw. 28. Körb. 285. Anzi Langob. 200.

GEOG. DISTRIB :—Switzerland, Bavaria, Austria, Sweden, Denmark, Norway, Finland.
BOT. PROV :—1...7...10...15...19...26...30.
ENGLAND :—Lounsdale! Cleveland. *Mr. Mudd.* Launceston, Cornwall. *Dr. Holl.* Cranbrook Castle; Islington, Devon. *Messrs. Jones and Kingston.*
SCOTLAND :—Ben Lawers. *Dr. Holl.* Castleton of Braemar; Blair Athole; Coast of Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Mangerton. *Dr. Taylor.* co. Antrim. *Adm. Jones.* Ballynakill! co. Galway. *Mr. Larbalestier.*
WALES :—Aberdovey! *Rev. A. Bloxam.* Cader Idris. *Dr. Holl.* Dolgelley! Barmouth! Glyder Vach! Llyn Cwlyd! Trefriw! Moel-y-gest! Crib Coch!
"Spermatia fine and delicate, cylindrical or subacicular." (*Mudd.*) "Spores .018—.024 mm. long, .008—.011 mm. broad." (*Nyl.*) "Spores .012—.022 mm. long, .006—.010 mm. broad." (*T. M. Fries.*) Spores .0155—.018 mm. long, .007—.008 mm. broad.

289. *L. mesoidea*, Nyl. *cinerascent*, thin, sub-opake, unequal, *sub-areolato-rimulose*, (K—C—); *apothecia black*, moderate, younger ones margined, then sub-convex and the margin evanescent, *concolorous within;* spores 8, colourless, oblong, 3-septate; paraphyses moderate, apices nigricant; *hypothecium black with a yellowish-red or cerasino-rufescent middle stratum;* gelatina hymenea cærulescent, then violet, with iodine.

On maritime micaceo-schistose rocks and old walls, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 475. Crombie En. 78.
GEOG. DISTRIB :—Europe.
BOT. PROV :—26...31.
IRELAND :—Killery Bay! Connemara. *Mr. Larbalestier.*
WALES :—Goodwick Bay! Pembrokeshire.
CHANNEL ISLANDS :—Sark. Fliquet Bay! Jersey. *Mr. Larbalestier.*
Approaching *L. acclinis*, (Flot.) but differs in the hypothecium, as also from *L. squamulosa*, Deak. by the distinct upper stratum of the hypothecium. The section of the hypothecium approaches most closely to that of *L. squamulosa*, but that species has a different thallus with different reaction, and larger spores of a different shape. "Spores .014—.017 mm. long, .006 mm. broad." (*Nyl.*) Spores .016—.018 mm. long, .0065—.007 mm. broad.

290. *L. premneoides*, Nyl. *pallido-virescent* or *cinereo-virescent*, slightly *leprose*, effuse, (K—C—); *apothecia black*, moderate, margined, plane, *epithecium* sometimes *sub-virescenti-suffused;* spores 8, colourless, oblong, obsoletely 3-septate; paraphyses slender; *hypothecium black;* gelatina hymenea vinous-red with iodine.

On walls in maritime localities, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 147. Crombie En. 79.
GEOG. DISTRIB :—Europe.
BOT. PROV :—26...31.
CHANNEL ISLANDS :—Noirmont! Jersey. *Mr. Larbalestier.*
IRELAND :—Doughruagh Mountain! Galway. *Mr. Larbalestier.*
Allied to *L. aromatica*, Ach. and *granosa*, Tuck. and with the aspect of *L. premnea*, Ach. "Spores .019—25 mm. long, .007—8 mm. broad." (*Nyl.*)

291. *L. subimbricata*, Nyl. *darkly-cinerascent*, *squamulose*, *squamules firm*, *subimbricate*, *subcrenate*, everywhere *concrescent;* *apothecia black*, plane, marginate, internally concolorous; *hypothecium and excipulum rubricose*; epithecium nigricant; spores 8, colourless, oblong, 3-septate; paraphyses distinct, moderate.

On calcareous rocks. 1876.

SYN :—Nyl. in Flora 1877. p. 460.
BOT. PROV :—26.
IRELAND :—Near Kylemore, Galway. *Mr. Larbalestier.* (1876.)

"Allied to *L. squamulosa*, Deak. but distinct by the thallus externally like that of *Pannaria microphylla*. Spores .013—16 mm. long, .0035—.0040 mm. broad. Gelatina hymenea I blue." (*Nyl.*)

292. *L. trachona*, (Ach.) *virescent*, thin, leprose, minutely areolate, (K—C—); *apothecia minute*, sessile, black, *scattered* or *confluent*, convex, margin obliterated; *hypothecium black;* paraphyses indistinct; spores 8, colourless, lineari-oblong, 3-septate.

On maritime rocks, rare. 1868.

SYN:—*Verrucaria*, Ach. Syn. 96. Nyl. in Flora 1864. p. 620. Crombie Enum. 71.
EXS:—Zw. 117. 104. Rabh. 846. Larbal. 80.
GEOG. DISTRIB:—Germany, Sweden.
BOT. PROV:—31.
CHANNEL ISLANDS:—Warren, Noirmont! Jersey. *Mr. Larbalestier.*
Spores .014 mm. long, .004 mm. broad. Spermatia long, slender, cylindrical, straight or curved.

293. *L. carbonacea*, (Anzi.) *fuscous-black*, sub-orbicular, thick, *glebuloso-diffract*, *squamules* small, *rugoso-convex*, *entire* or *inciso-crenate*, (K—C—); apothecia small, black, sessile, solitary or aggregate, plane, margined, eventually convex and immarginate; *hypothecium thick*, *reddish-black;* paraphyses distinct, apices black; *spores* 8, colourless, lineari-oblong, straight or curved, 3-septate.

On calcareous rocks, rare. 1870.

SYN:—*Toninia*, Anzi Cat. Sondr. 68. (1860.) Crombie Enum. 78.
EXS:—Anzi Langob. 115.
GEOG. DISTRIB:—Lombardy.
BOT. PROV:—15...26.
SCOTLAND:—Craig Guie, Braemar. *Rev. J. M. Crombie.* (1870.)
IRELAND:—Recess Road five miles from Kylemore! *Mr. Larbalestier.*
"Spores .0153—.0220 mm. long, .004 mm. broad." *(Anzi.)* Spores .015— mm. long, .0045 mm. broad.

294. *L. delimis*, Nyl. *dark-greyish*, verrucoso-granulate or rugose, moderate, (K yellow C red), hypothallus subfimbriate, infuscate, limiting the thallus; *apothecia black*, at length convex, immarginate, *greyish-suffused*, concolorous within; *hypothecium thick*, *black* or *black-brown; epithecium* conspicuously coarsely granulate; *spores* 8, colourless, lineari-oblong or lineari-subfusiform, 3-septate; paraphyses distinct; gelatina hymenea tawny-wine-coloured or somewhat reddish with iodine

On granitic rocks, rare. 1873.

SYN:—Nyl. in Flora 1873. pp. 289—300.
BOT. PROV:—31.
CHANNEL ISLANDS:—On east side of Mont Orgueil Castle, Jersey! *Mr. Larbalestier.* (1873.)
"Belongs to section of *L. premnea*. Spores .015—18 mm. long, .004—.5 mm. broad." (*Nyl.*) Spores .21—23 mm. long, .004—5 mm. broad.

295. *L. leucoblephara*, Nyl. *cinereo-virescent* or *cinerascent*, subdeterminate or indeterminate, thin, opake, (K y C—); *apothecia fuscous-black or black*, small, plane or somewhat plane, *with a white lecanorine margin*, internally nigricant; *hypothecium thick*, *nigro-fuscous;* hymenium dusky-brown, paraphyses cohærent; *spores* 8, *colourless*, *fusiform*, 3-*septate*.

On quartz rocks, very rare. 1877.

SYN:—Nyl. Nov. Gran. p. 52. (1863. & 1864.)

GEOG. DISTRIB :—Carolina, Nova Granada, Armorica.
BOT. PROV :—26.
IRELAND :—Near Kylemore ! *Mr. Larbalestier.* (1877).
"Spores .010—19 mm. long, .003—.5 mm. broad. Gelatina hymenea I blue then vinoso-obscurate." (*Nyl.*)

296. *L. chloroscotina*, Nyl. *virescent*, thin, subtartareous, *continuous, rimulose ; apothecia black*, scattered or congregate, *adnate, plane with a thin margin ; hypothecium nigro-fuscous* ; hymenium bluish, paraphyses cohærent, apices colourless ; *spores* 8, *colourless, lineari-oblong*, 3-*septate.*

On wet stones, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 565.
BOT. PROV :—26.
IRELAND :—On stepping-stones between Lough Feagh and Lough Muck ! Galway. *Mr. Larbalestier.* (1877.)
"Spores oblongo-fusiform, simple, .008—.014 mm. long, .003—4 mm. broad. Spermatia ellipsoid .002 mm. long, .001 mm. broad." (*Nyl.*) I describe the spores as I saw them in Mr. Larbalestier's communicated specimen.

297. *L. Dilleniana*, (Ach.) *albo-cinerascent* or *cinereo-nigrescent, granulose* or *diffract, sub-gyroso-verrucose, (K yellow C orange) ; apothecia* black, naked or *albo-pruinose*, appresso-sessile, scattered or aggregate *; hypothecium nigro-fuscous, almost nigricant ; spores* 8, colourless, *aciculari-fusiform*, 3-septate, *large.*

On maritime and subalpine rocks, rare.

SYN :—Ach. Prod. 57. (1798.) Syn. 30. Nyl. Scand. 240. Mudd Man. 223.
FIG :—Ach. Prodr. t. 1. f. 1. Grevillea 2. t. 26. f. 1.
EXS :—Leight. 336. Mudd 199.
GEOG. DISTRIB :—Sweden.
BOT. PROV :—3...7...10...12...15.
ENGLAND :—Cleveland ! Yorkshire. *Mr. Mudd.* Brightlingsea ! *Mr. Varenne.* Staveley near Kendal. *Mr. Martindale.*
SCOTLAND :—Trossachs ; Aviemore ; and Achallater, Braemar. *Rev. J. M. Crombie.*
WALES :—Aberdovey ! *Rev. A. Bloxam.* Moel-y-gest ! near Tremadoc.
"Spores .023—.030 mm. long, .005—.006 mm. broad." (*Nyl.*) Spores .026—.034 mm. long, .005—.007 mm. broad.

298. *L. aromatica*, (Sm.) *greyish-white*, tartareous, rugose, *granulato-congested*, (K faintly yellow) ; apothecia small, solitary or aggregated, sub-sessile, plane, black, with a thin sub-flexuose margin, or plano-convex and immarginate ; *hypothecium* and excipulum, thick, *nigricant ; spores* 8, colourless, *oblongo-cylindrical*, 3-septate.

On the earth, old walls, rocks, &c. frequent. 1807.

SYN :—Sm E. Bot. 1777. (1807.) Ach. Syn. 19. Nyl. Prod. 123. Mudd Man. 174.
FIG :—E. Bot. 1777. Hepp Sporen t. 32. f. 283.
EXS :—Leight. 154. Zw. 280. Larbal. 85.
GEOG. DISTRIB :—France, Algeria, Italy, Germany, Sweden, Norway, Finland.
BOT. PROV :—1, 2...4, 5...7...11...16...19...26...28...30, 31.
ENGLAND :—Yarmouth. *Mr. Turner.* (1807.) Sussex Downs ! *Mr. Borrer.* Torquay ! *Dr. Deakin.* near Eglestone, Durham. *Rev. J. Harriman.* near Exeter. *Mr. Hemmings.* Whittington near Worcester ; Bolt Head ; Fairlight near Hastings ; Isle of Wight. *Dr. Holl.* Budleigh Salterton, Devon. *Dr. Dickie.* Plymouth. *Mr. Holmes.* Penzance. *Mr. Curnow.* Ightham, Barming, Kent. *Mr. Holmes.* Llanymynech Hill ! Shropshire.
SCOTLAND :—Appin, Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND :—Near Blarney! Upper Glanmire! near Cork. *Mr. Carroll.* Lettermore! *Mr. Larbalestier.* Ardglass co. Down. *Dr. Maingay.* Armagh. *Adm. Jones.*

WALES :—Barmouth! Dolgelley! Dolbadarn Castle! Snowdon.

CHANNEL ISLANDS :—St. Aubin's Harbour, Mont Orgueil Castle, Jersey! and on all the Islands. *Mr. Larbalestier.*

A var. *hypnophila*, Nyl. has been found on mosses on Ben Lawers by *Adm. Jones.* (Crombie En. 78), and also at Caswell Bay! Mumbles, by myself.

"Spores .004 to .005 in. long by .001 in. broad." (*Mudd.*) "Spores .013—.025 mm. long, .0025—.0045 mm. broad." (*Nyl.*) "Spores .016—24 mm. long, .004—5 mm. broad." (*T. M. Fries.*) Spores .02—.0245 mm. long, .004—5 mm. broad.

299. *L. squamulosa*, Deak. MS. *pale-brown*, thin, crustaceo-cartilaginous, *squamulose, squamulæ sub-imbricated* or flattish, appressed and rimulose, *crenate, (K yellow, then turning dusky)*; apothecia small, solitary or aggregated, appressed or sub-sessile, plane, or convex and deformed, black, margin thickish; *hypothecium* darkish-reddish-brown thick, excipulum thin nigro-or rufo-fuscous; *spores* 8, colourless, *lineari-cylindrical*, 3-septate, cells nucleolate, half the size of those of *L. aromatica.*

On rocks and walls, not frequent. 1853.

SYN :—Salwey in Penzance Nat. Hist. Soc. Trans. 1853. p. 144. Mudd Man. 174.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1, 2...7, 8...15...19...28...31.

ENGLAND :—Trengwainton! Penzance. *Rev. T. Salwey.* (1853.) Torquay! Devon. *Dr. Deakin.* Matlock! *Mr. Wilson.* Madron Workhouse! near Penzance. *Mr. W. Curnow.* Llanymynech Hill! Shropshire.

SCOTLAND :—Slaghead Kirk, Coast of Kincardine; near Stonehaven, Kincardineshire. *Rev. J. M. Crombie.*

IRELAND :—Blackrock! *Mr. Carroll.* Armagh. *Adm. Jones.*

WALES :—Barmouth. *Mr. Holmes.*

CHANNEL ISLANDS :—Herm. *Mr. Larbalestier.*

"Spores .003 in. long by .001 in. broad." (*Mudd.*) Spores .015—.018 mm. long, .004—.005 mm. broad.

300. *L. Turneri*, Leight. *glaucous-white*, thick, tartareo-farinose, *areolato-verrucose, turgid*, sublobate, (K—C—); *apothecia* solitary or confluent, *appresso-sessile, black*, plane or convex, margined; *hypothecium black, thick; spores* 8, colourless, lineari-cylindrical or lineari-fusiform, 3-septate, (occasionally 2-or 4-septate,) *small.*

On mortar, in walls, &c., rare.

SYN :—*L. candida*, E. Bot. 1138. (1803.)

FIG :—E. Bot. 1138.

GEOG. DISTRIB :—Europe.

BOT. PROV :—1...4, 5, 6...26.

ENGLAND :—Trigby Church! near Yarmouth. *Mr. Turner.* Torquay! Devon. *Dr. Deakin.* High Rock! Bridgnorth, Shropshire.

WALES :—Bishopston Churchyard! Glamorganshire.

IRELAND :—Near Dawros Bridge! Galway. *Mr. Larbalestier.*

Similar in general appearance to *L. mamillaris*, but distinct by the spores and reaction, both from that and *L. Dilleniana.* Spores .015—.016 mm. long, .0035 mm. broad.

301. *L. melæna*, Nyl. *fusco-nigricant, leproso-granulose*, thin, effuse, (K—C—); *apothecia minute, convex, black, internally concolorous*, immarginate; *hypothecium black*; hymenium darkish-

blue, paraphyses distinct, apices nigricant; spores 8, colourless, lineari-oblong, 3-septate.

On the earth and old wood, rare.

SYN :—Nyl. in Bot. Notis. 1853. p. 182. Scand. 205. Mudd Man. 188.
EXS :—Fries L. S. Exs. 212 B. (fide Nyl.) M. & N. 1329. Fellm. 159. Mudd 159.
GEOG. DISTRIB :—Scandinavia, Switzerland.
BOT. PROV :—2...5...7...15...19...23.
ENGLAND :—New Forest. *Rev. J. M. Crombie.* Leigh Wood, Bristol. *Mr. Joshua.* Chelsfield, Oxford, Shoreham, Wrotham, Kent. *Mr. Holmes.*
SCOTLAND :—Grampians; Braemar. *Rev. J. M. Crombie.*
IRELAND :—Howth. *Adm. Jones.* Crogham, Killarney. *Mr. Carroll.*
WALES :—Trefriw! (on fir).
"Spores .0025 to .004 in. long, by .0005 to .001 in. broad." *(Mudd.)* "Spores .014—.22 mm. long, .005—6 mm. broad. Hymenium bluish. Gelatina hymenea I blue then dark-violet." (*Nyl.*) "Spores .012—22 mm. long, .004—6 mm. broad." (*T. M. Fries.*) Spores .015 mm. long, .004 mm. broad.

302. *L. abietina*, Ach. *white* or *whitish*, thin, *leprose*, effuse, (K—C—); *apothecia* moderate or large, numerous, scattered, sessile, black, *thickly suffused with a whitish or pale-yellowish pruina*, rarely naked, plane or sub-convex, margin thickish, prominent, flexuose; *hypothecium black*; spores 8, colourless, aciculari-fusiform or sub-bacilliform, 3-septate.

On old trees in mountainous regions, not unfrequent. 1830.

*Verrucaria leucocephala*, E. Bot. Suppl. 2642. f. 2. and *Pyrenothea leucocephala*, Leight. Ang. Lich. t. 28. f. 1. Exs. 164. Schær. 533. Anzi Ven. 84. M. & N. 757. are the spermogonia.
SYN :—Ach. L. U. 188. (1810.) Syn. 30. Nyl. Scand. 241. Mudd Man. 223.
FIG :—E. Bot. Suppl. 2642. fig. 2. Leight. Ang. Lich. t. 28. fig. 2.
EXS :—Schær. 534. Hepp. 517. 767. Arn. 88. Leight. 163. Mudd 200. Zw. 421.
GEOG. DISTRIB :—Sweden, Germany, Switzerland, Bavaria.
BOT. PROV :—1, 2, 3...8...10...19...29...31.
ENGLAND :—New Forest! *Mr. Lyell.* (1830.) Westerdale! Stogdale! Hobhole! Cleveland. *Mr. Mudd.* Devon. *Mr. Parfitt.* Bradgate Park, Leicestershire. *Rev. A. Bloxam.* Tunbridge Wells. *Mr. Jenner.*
IRELAND :—Killarney and Carig Mountain, Kerry. *Dr. Taylor.* Donegal. *Dr. Moore.* Crogham and Eagle's Nest, Killarney. *Mr. Carroll.*
CHANNEL ISLANDS :—Jersey! Guernsey. *Mr. Larbalestier.*
"Spores .007 to .008 in. long by .001 in. broad." *(Mudd.)* "Spores .03—.045 mm. long, .0045—.006 mm. broad. Paraphyses slender. Gelatina hymenea I pale-blue then vinous-red." *(Nyl.)* Spores .035—.04 mm. long, .003—.004 mm. broad. Spermatia very large, oblongo-cylindrical, somewhat tapering at one or both ends, straight or curved, .012—.016 mm. long, .003—.004 mm. broad.

303. *L. thiopsora*, Nyl. *sulphury-whitish, granulato-conglomerate*, consisting of sub-pulvinato-concrescent granules, pulvinuli somewhat plane or variously confluent (K yellow); *apothecia black, convex, often* 2-4-*connate*, internally concolorous; paraphyses slender, not well discrete, *hypothecium fuscous*; *spores* 8, *colourless, bacillar or subacicular, straight or straightish*, 3-septate.

On Jungermanniæ, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 573.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1876.)
"Spores .022—30 mm. long, .0025—.0035 mm. broad. Gelatina hymenea I—, thecæ, especially their apices, cærulescent. Gonidia diam. .004—6 mm." (*Nyl.*)

304. *L. rhexoblephara*, Nyl. *albido-cinerascent*, very thin or evanescent; *apothecia black*, moderate, plane, *margin thick*, *rhagadioso-diffract or crenate, internally concolorous*; *hymenium whitish*; *hypothecium dark-fuscous*; spores 8, colourless, oblongo-ellipsoid or fusiformi-ellipsoid, 3-septate.

On decaying mosses in alpine localities, rare. 1861.

SYN:—Nyl. in Ofvers. V. Ak. Förk. 1860. p. 297. Scand. 240. and 293. Grevillea 1. 134.

GEOG. DISTRIB:—Norway, Behrings' Straits, Finland, Greenland.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Adm. Jones.* (1861.)

"Spores .017—21 mm. long, .007 mm. broad. Paraphyses slender, apices fuscescent, somewhat incrassate, 3-articulate, adglutinate. Gelatina hymenea I pale-blue." (*Nyl.*) Spores .017—.02 mm. long, .0045—.005 mm. broad.

** *Hypothecium colourless.*

305. *L. exanthematica*, (Sm.) *cinerascent*, very thin or evanescent, (K—C—); *apothecia pale-yellow*, small, *margin connivent*, *radiato-fissured*, at length exposing the epithecium; hypothecium pale-yellow; spores 8, colourless, lineari-oblong or cylindrical, 3-septate, large.

On calcareous rocks, frequent. 1791.

SYN:—Sm. Linn. Soc. Tr. 1. 81. (1791.) *Thelotrema*, Leight. Ang. Lich. 32. Ach. Syn. 116. *Lecidea*, Nyl. Scand. 188. Mudd Man. 278.

FIG:—E. Bot. 1184. Leight. Ang. Lich. t. 12. f. 3.

EXS:—Anzi It. S. 235. Zw. 211. Hepp 206. M. & N. 846. Schær. 122. Leight. 256.

GEOG. DISTRIB:—Switzerland, Germany, Hungary, Italy, Sweden.

BOT. PROV:—2...5...7...10, 11...19...26...28...30.

ENGLAND:—Banks of Tees, Durham. *Rev. J. Harriman.* Sussex Downs! *Mr. Borrer.* Ingleborough. *Dr. Carrington.* Durdham Down near Bristol. *Miss Attwood.* Rokeley and Barnardcastle, Durham. *Mr. Winch.* near Cirencester! *Mr. Joshua.* Lamplugh! Cockermouth. *Mr. J. Bowman.*

IRELAND:—Killarney! *Dr. Taylor.* near Belfast. *Mr. Templeton.* Sheepwalk; Armagh. *Adm. Jones.* near Kylemore. *Mr. Larbalestier.*

WALES:—Eglwyseg rocks! near Llangollen.

"Spores .005 to .006 in. long, by .0015 in. broad." (*Mudd.*) "Spores .015—20 mm. long, .006—7 mm. broad. Paraphyses slender." (*Nyl.*) Spores .023—.026 mm. long, .006—.008 mm. broad.

306. *L. violacea*, Crouan. *albido-cinerascent*, very thin, almost evanescent; *apothecia pallido-livid*, small, sub-convex; hypothecium colourless; *spores* 8, colourless, oblong, obtuse, 3-*septate*.

On maritime rocks, rare. 1860.

SYN:—Crouan Fl. Finistere p. 93. (1867.) Nyl. in Flora 1862. p. 464. Crombie En. 71.

GEOG. DISTRIB:—France, Sweden.

BOT. PROV:—18.

SCOTLAND:—Lerwick, Shetland. *Adm. Jones.* (1860.)

"Spores .012—18 mm. long, .003—5 mm. broad." (*T. M. Fries.*)

307. *L. metamorphea*, Nyl. *green*, thin, effuse; *apothecia whitish or pale-flesh-coloured* or sordid, small or moderate, *innate*, somewhat plane, sometimes difformed or two confluent, internally concolorous; *spores* 8, *colourless, oblong or oblongo-fusiform, simple or* 3-*septate*; paraphyses none; thecæ oblong, crowded, blue with iodine then vinous-red.

On stones, rare. 1872.

SYN:—Nyl. Prod. 113. (1857.) Crombie in Journ. Bot. n. s. 2. 134

BOT. PROV:—15.

SCOTLAND :—Glen Fender, Blair Athole. *Rev. J. M. Crombie* (1872).
"Spores .019—32 mm. long, .006—7 mm. broad." *(Nyl.)*

var. *septenaria*, Nyl.
Fissures of rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 239.
BOT. PROV :—26.
IRELAND :—Recess Road ! near Kylemore. *Mr. Larbalestier.* (1876).
"Spores 7-septate .030—34 mm. long, .007—8 mm. broad." (*Nyl.*)

308. *L. albovirella*, Nyl. *virescent, thin*, effuse, *subpulverulento-granular ; apothecia pale-white-flesh-coloured, very minute*, numerous, scattered, *adnato-sessile*, immarginate ; hypothecium colourless ; paraphyses cohærent, apices colourless ; *spores* 8, *colourless, oblongo-cylindrical, obsoletely* or *indistinctly* 3-*septate.*
On shady rocks, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 567.
BOT. PROV :—26.
IRELAND :—Lough Feagh ! *Mr. Larbalestier.* (1877).
"Spores .019 mm. long, .0035 mm. broad." "Allied to *L. chlorotropa*, Nyl. Gelatina hymenea I blue then the asci violet-red." (*Nyl.*)

forma *depauperata*, Leight. thallus subevanescent.

IRELAND :—Killery Bay ! Connemara. *Mr. Larbalestier.*

309. *L. hemipolioides*, Nyl. *pale-dirty-yellow, furfuraceous*, very thin, effuse, almost evanescent ; *apothecia* moderate, *livido-virescent, convex, immarginate*, scattered or confluent, *when moist one half appearing darker in colour than the other half*, sessile ; hypothecium colourless ; *spores* 8, *colourless, lineari-oblong, somewhat ellipsoid*, 3-*septate, minute ; paraphyses remarkably much branched*, apices colourless ; gelatina hymenea and especially the thecæ bluish with iodine.
On rocks, very rare. 1873.

SYN :—Nyl. in Flora 1873. p. 294.
BOT. PROV :—31.
CHANNEL ISLANDS :—Near Archirondel Tower, Jersey ! *Mr. Larbalestier.*
"Spores .012—18 mm. long, .0045 mm. broad." *(Nyl.)* Spores .0125—.014 mm. long, .004 mm. broad. The apothecia have a semi-transparent hyaline appearance on one side, whilst on the other they are dark, reminding one slightly of the appearance of the moon during a partial eclipse. The dark colour inclines in the same direction on all the apothecia.

310. *L. hyalinescens*, Nyl. *albido-cinerascent*, very thin, effuse, *subfurfuraceous ; apothecia pale-dirty-rosy, hyalino-corneous* or *waxy, large, appressed*, crowded, *somewhat concave, with a whitish, very thick, slightly albo-pulverulent, persistent horny margin ; hypothecium colourless ;* paraphyses very slender ; *spores* 8, *colourless, lineari-oblong* or *oblongo-fusiform*, 3-*septate.*
On river banks, very rare. 1876.

SYN :—Nyl. Prodr. p. 109. (1857).
GEOG. DISTRIB :—France.
BOT. PROV :—26.
IRELAND :—Twelve Pins ! Kylemore ! Connemara. *Mr. Larbalestier.* (1876).
"Gelatina hymenea I—, thecæ vinoso-fulvescent. Spermatia slender, straight, .004 mm. long, on short simple sterigmata. Spores .016 mm. long, .005 mm. broad." (*Nyl.*) Spores .021 mm. long, .005 mm. broad.

311. *L. herbidula*, Nyl. *pale-yellow, thickish, areolato-diffract, pulverulento-granulate; apothecia rufo-fuscous, minute, subinnate,* scattered, plane, with a thin darker margin; *hypothecium colourless; spores* 8, *colourless, lineari-oblong,* 3-*septate, small.*

On damp cliffs, very rare. 1877.

SYN :—Nyl. in Flora 1877. p. 563.
BOT. PROV :—26.
IRELAND :—Glencorbot! *Mr. Larbalestier.* (1877).
Spores .0115 mm. long, .0025 mm. broad. Nylander l. c. describes the spores as "fusiformes, 1-3-septatæ, .011—18 mm. long, .0025 mm. broad," and gelatina hymenea I blue. Of the thallus he says, "Thallus omnino est peculiaris et facile proprium genus conformans (si proprius), nam sistit *Gongrosiram*, Ktz. et format stratum e filamentis intricatis brevinsculis articulatis subchroolepoideis, articulis pariete incolore crassulo strata nonnulla offerente et contento e granulis flavoviridibus rotundatis numerosis constituto, articulis his rotundis aut oblongis (latit. .015—35 mm.), majoribus facile discretis, divisione transversa sese multiplicantibus; sed adsunt simul gonidia parva sparsa inter filamenta gongrosirea et cellulas discretas gongrosireas, cur subincertum manet quinam verus thallus sit hujus Lecideæ."

312. *L. sphæroides*, (Dicks.) *albo-virescent, granulose,* sub-pulverulent; *apothecia pale-whitish* or *pale-yellow-flesh-colour, congregate,* convex, sub-globose; *hypothecium pale;* spores 8, colourless, oblongo-fusiform, 3-septate.

On trees and mosses, not common. 1785.

SYN :—Dicks. Crypt. Brit. 1. p. 9. (1785). Smrflt. Lapp. 164. Nyl. Scand. 204. Crombie En. 70.
FIG :—Dicks. l. c. t. 2. f. 2.
EXS :—Fellm. 158. Anzi Langob. 261.
GEOG. DISTRIB :—Scandinavia, Italy, Switzerland, Germany.
BOT. PROV :—1, 2, 3...15...26...28.
ENGLAND :—Lustleigh Cleeve; Barrack wall, Topsham road, Exeter. *Mr. Parfitt.* Kelvedon, Feering, Essex. *Mr. Varenne.* Toy's Hill, Seven Oaks, Kent. *Mr. Howse.*
SCOTLAND :—Midland parts. *Rev. J. M. Crombie.* Aberfeldy. *Dr. Holl.*
IRELAND :—(f. *rediens*, Nyl.) Florence court, Fermanagh. *Adm. Jones.* (f. *racillans*, "apotheciis rufescentibus, sporis 1-3-septatis.") Armagh demesne. *Adm. Jones.* near Letterfrack! *Mr. Larbalestier.*
"Gelatina hymenea I slightly blue then vinous-red. Spores .015—23 mm. long, .005—8 mm. broad." (*Nyl.*)

313. *L. carneo-lutea*, (Turn.) *whitish,* glaucescent, thin, smooth, effuse, (K—C—); *apothecia* numerous, minute, *innato-emergent, at first veiled by the pale hypothecium, which afterwards is irregularly stellato-dehiscent,* disclosing the plane *yellow-flesh-coloured* disk, margin albicant, lacerate or crenate; spores 8, colourless, lineari-oblong, 3-septate.

On trees, especially elm, rarely on ash. 1808.

SYN :—Turn. Trans. Linn. Soc. 9. 145. (1808.) Nyl. Prodr. 101. Mudd Man. 140.
FIG :—Trans. Linn. Soc. t. 12. f. 2. E. Bot. 2010. Leight. Brit. Ang. Lich. t. 14. f. 2.
EXS :—Fries 342. Larbal. 30. Leight. 363.
GEOG. DISTRIB :—Sweden.
BOT. PROV :—1, 2, 3, 4...31.
ENGLAND :—Sussex! and Isle of Wight. *Mr. Borrer.* (1808.) Torquay! Devon. *Dr. Deakin.* Shoreham, Sussex. *Mr. Larbalestier.* near Ventnor, Isle of Wight; Ilsam, Torquay. *Dr. Holl.* Cawick fields, Exeter. *Mr. Parfitt.* Beeding Priory, Sussex! *Rev. A. Bloxam.* Penzance. *Mr. Curnow.* Eastbourne! Suffolk. *Mr. Roper.* Lewes, Sussex; Brading and St. Lawrence, Isle of Wight. *Mr. Holmes.*

CHANNEL ISLANDS :—Quenvais; St. Brelade's! Jersey; Saint's Bay, Guernsey. *Mr. Larbalestier.*

"Spores .00275 to .0035 in. long, by .001 in. broad." (*Mudd.*) "Spores .011—13 mm. long, .005—6 mm. broad." *(Nyl.)* Spores .013—.014 mm. long, .004—.0045 mm. broad.

314. *L. ternaria*, Nyl. *albido-cinerascent, minutely granulate*, sub-pulverulent, thin, effuse; *apothecia black*, shining, small, congregate, plane with an indistinct margin, *then convex and immarginate; hypothecium colourless;* paraphyses distinct, apices colourless; *spores* 8, *colourless, obtusely fusiform*, 3-*septate*, cells nucleolate.

On moss and stones, rare. 1877.

SYN :—Nyl. Lapp. Or. 151. (1866.) Flora 1877. p. 232.
GEOG. DISTRIB :—Eastern Lapland.
BOT. PROV :—5...26...31.
ENGLAND :—Wapley Hill! Herefordshire.
IRELAND :—Lough Feagh! opposite Leenane, Kylemore! *Mr. Larbalestier.* (1877).
CHANNEL ISLANDS :—The Warren, Noirmont! Jersey. *Mr. Larbalestier.*

"Spores .014—22 mm. long, .0045—.0055 mm. broad. Epithecium nigricanti-cærulescent. Gelatina hymenea I blue, then (especially thecæ), vinous-red." *(Nyl.)* Spores .018—.022 mm. long, .005—.006 mm. broad.

315. *L. squalida*, Ach. *cervino-fuscescent*, cartilaginous, *squamose, concrescent, rugoso-plicate*, often diffract into pulvinuli, *squamæ sublobate; apothecia black, adnate*, plane, margined, at length convex irregular and confluent, internally whitish; paraphyses cohærent, apices nigricant; *hypothecium colourless; excipulum externally violaceo-nigricant; spores* 8, *colourless, cylindrical* or *fusiformi-cylindrical, obtuse and broadish at one apex, attenuate at the other*, simple or 3-*septate*, straight or curvate.

On the earth, rare. 1872.

SYN :—Ach. L. U. 169. (1810.) Nyl. Scand. 216. Crombie in Journ. Bot. n. s. 2. 134.
FIG :—Hepp Sporen t. 15. f. 123.
EXS :—Schær. 170. Hepp 123. Anzi Langob. 138.
GEOG. DISTRIB :—Scandinavia, Italy, Switzerland.
BOT. PROV :—15.
SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.* (1872.)

"Spores .018—36 mm. long, .0035—.0045 mm. broad." (*Nyl.*) "Spores .026—46 mm. long, .002—4 mm. broad. Gelatina hymenea I blue (especially apices of thecæ) then vinous-red. Spermatia acicular, very slender, variously curvate." *(T. M. Fries.)* Spores .0255—.0275 mm. long, .004 mm. broad.

316. *L. circumpallens*, Nyl. *pallido-cinerascent*, thin, *rimose; apothecia fuscous-black or fusco-rufescent*, plane or sub-convex, margin pale; *hypothecium colourless; spores* 8, colourless, *fusiform* or fusiformi-acicular, straight, 3-*septate*.

On argillaceous earth, rare.

SYN :—Nyl. in Flora 1866. p. 370.
GEOG. DISTRIB :—Europe.
BOT. PROV :—24.
IRELAND :—Kilkee and Ross co. Clare. *Mr. Carroll.*

"Vix nisi varietas *L. bacilliferæ*." "Spores .018—25 mm. long, .0020—.0035 mm. broad. Epithecium somewhat nigrescent or nearly colourless. Paraphyses thickish, not well discrete. Gelatina hymenea I pale-blue then vinous-red." *(Nyl.)*

317. *L. cupreo-rosella*, Nyl. *bright-copper-colour, somewhat*

*virescent*, leprose, *pulveraceo-granulose*, at length areolate; *apothecia* black, minute, at first punctiform, then patellulate, *castaneo-fuscous and pale-red*, marginate; hypothecium colourless; spores 8, colourless, lineari-elliptical, subacicular, 3-septate.

On peaty earth, rare. 1869.

SYN:—Nyl. Enum. 122. (1858.) *Bilimbia cuprea*, Mass. Sert. 77. (1856.)
GEOG. DISTRIB:—Bavaria.
BOT. PROV:—10.
ENGLAND:—Bilsdale, Yorkshire. *Mr. Mudd.* (1869.)
"Spores .0183 mm. long, .00150 mm. broad." *(Mass.)*

318. *L. foveolaris*, (Ach.) *whitish*, crustaceous, thick, coarsely *verrucoso-granulate*, effuse, (K—C—); *apothecia immersed, foveolate*, large, *pale-yellow-flesh-coloured*, proper margin entire, elevated, paler, entirely covered by irregular crenulate thallodal one; hypothecium colourless; spores 8, colourless, oblong or ellipsoid, 3-septate.

On moist turfy earth in alpine places, rare.

SYN:—*Urceolaria*, Ach. Meth. 149. (1803.) *Gyalecta Wahlenbergiana*, Ach. Syn. 9. *Lecidea*, Nyl. Scan. 190.
FIG:—Mass. Ric. f. 284.
EXS:—Th. M. Fries 10. Fellm. 145. Somrft. 52.
GEOG. DISTRIB:—Finmark, E. Lapland, Germany, Italy.
BOT. PROV:—8.. 10, 11...15.
ENGLAND:—Teesdale, Durham. *Rev. J. Harriman.* near Boltby, Thirsk, Yorkshire. *Mr. Baker.* near Newton, Cleveland. *Mr. Mudd.* Charnwood Forest, Leicestershire. *Rev. A. Bloxam.*
SCOTLAND:—Ben Lawers; Morrone. *Rev. J. M. Crombie.* Finlarig near Killin. *Dr. Holl.*
"Spores .018—21 mm. long, .007 mm. broad." *(Nyl.)* "Spores .016—18 mm. long, .006—7 mm. broad." *(T. M. Fries.)* Iodine turns the thick, horny excipulum, hymenium, and paraphyses pale-vinous-brown, asci dull-blue. Spores .017—.019 mm. long, .007 mm. broad.

319. *L. geoica*, (Whlnb.) *cinerascent*, thin, *sub-pulverulent, sub-evanescent; apothecia* minute, immersed, *cupular, waxy, pale-yellow-flesh, margin entire, persistent, waxy, naked or nearly so, white;* hypothecium pale; spores 8, colourless, oblong or ellipsoid, 3-septate.

On the ground among mosses, on calcareous rocks, not common. 1870.

SYN:—Whlnb. Vet. Ak. H. 1806. p. 142. Ach. Syn. 9. Nyl. Scand. 190.
FIG:—Vet. Ak. H. 1806. t. 4. f. 5. Leight. Ang. Lich. t. 13. f. 2.
EXS:—Leight. 123. Arn. 38. 459.
GEOG. DISTRIB:—Gothland, Finland, Hungary, Germany.
BOT. PROV:—5...15.
ENGLAND:—Wickliffe rocks near Ludlow! *Rev. T. Salwey.*
SCOTLAND:—Ben Lawers! *Rev. J. M. Crombie.* (1870.)
"Spores .016—21 mm. long, .006—7 mm. broad." *(Nyl.)* "Spores .012—15 mm. long, .006 mm. broad." *(T. M. Fries.)* Spores .016—.0175 mm. long, .007 mm. broad.

G. *Spores vermiform, spirally contorted.*

320. *L. umbrina*, Ach. *nigricant or nigro-virescent, granuloso-leprose*, thin, effuse, *often evanescent*, (K—C—); apothecia black, plane or convex, small; hypothecium colourless; *spores* 8, colourless, *vermiformi-cylindrical, spirally contorted*, 3-5-multiseptate.

On rocks and stones, frequent. 1854.

SYN :—Ach. L. U. 183. (1810.) Nyl. Scand. 209. *L. vermifera*, Nyl. olim *L. holomelæna*, Flk. Mudd Man. 185. *L. pelidna*, Leight. L. Fl. 2d. ed. 344.
FIG :—Mudd. Man. t. 3. f. 69.
EXS :—Leight. 158. Mudd 153. Zw. 29.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...5...7...10...15, 16...(19...26...30)...31.
ENGLAND :—Broughton, Cleveland. *Mr. Mudd.* Shermanbury, Sussex. *Mr. Larbalestier.* Hales End, Malvern; near Launceston, Cornwall. *Dr. Holl.* Wrekin! Haughmond Hill! Llanymynech Hill! Sutton! Mytton Bach! Stiperstones, Shropshire.
SCOTLAND :—Glen Fender, Blair Athole! Coast of Kincardine; Braemar; Appin; Craig Guie; The Khoil. *Rev. J. M. Crombie.*
IRELAND :—On rocks and stones frequent. *Mr. Carroll.* near Rinvyle! near Kylemore! near Dawros Bridge! co. Galway. *Mr. Larbalestier.*
WALES :—Pass of Llanberis! Snowdon; Cader Idris! Drwsynant! Crib Coch!
CHANNEL ISLANDS :—Noirmont! Le Fret Point! Jersey. *Mr. Larbalestier.*
"Spores .005 in. long by .00025 in. broad. Spermatia short, cylindrical, straight." (*Mudd.*) "Spores .020—.040 mm. long, .0025—.0035 mm. broad." (*Nyl.*) "Spores .02—.04 mm. long, .002—3 mm. broad." (*T. M. Fries.*) Spores .026—.034 mm. long, .003—4 mm. broad.

forma *compacta*, (Körb.) *fuliginous, thickish, granuloso-leprose*, or *rimuloso-diffract*; apothecia *very black*, minute, adnate, convex.

On rocks and walls, not unfrequent.

SYN :—Körb. Syst. 268. (1855.)
EXS :—Leight. 158. (in part).
BOT. PROV :—5...7...9, 10...26.
ENGLAND :—Kildale! Yorkshire. *Mr. Mudd.* Long Mynd! Preston-on-Wealdmoors! Lyth Hill! Shropshire. Wapley Hill! Herefordshire. Parkgate! Cheshire.
IRELAND :—Doughruagh! and Tullywhee Bridge, Kylemore. *Mr. Larbalestier.*
WALES :—Craig Breidden! Pen-maen-mawr! Nant Gwynant! Cwm Tryfaen!

forma *leptomerea*, Smrft. *ochraceous, furfuraceo-granulate*, very thin; *apothecia nigro-fuscous*, minute, scattered.

On rocks, rare. 1874.

SYN :—Smrft. Lapp. 161. (1826.)
BOT. PROV :—7.
WALES :—Trefriw! (1874.)

forma *pelidniza*, Nyl. *umbrino-virescent*, crustaceous, thin, effuse, *minutely granulato-rimulose* or sub-diffract; *apothecia livido-subfuscous*, small, numerous, scattered, sessile.

On rocks, not common. 1876.

SYN :—Nyl. in Flora 1874. p. 318.
BOT. PROV :—1...5, 6, 7...26.
ENGLAND :—Penzance! *Rev. T. Salwey.* Haughmond Hill! Shropshire.
IRELAND :—Lough Feagh! Twelve Pins! Lettermore! co. Galway. *Mr. Larbalestier* (1876.)
WALES :—Moel-y-gest! near Tremadoc. Fishguard!

forma *turgida*, (Körb.) *cinereo-virescent, granuloso-leprose*, thickish; *apothecia flesh-coloured*, then fuscous-black, *cephaloid*, turgid.

On rocks, rare. 1865.

SYN :—*Scolioporum turgidum*, Körb. Par. 241. (1865.)
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...24.

IRELAND :—Near Kilkee! co. Clare. *Mr. Carroll.* (1865.)
WALES :—Near Dolgelley!

forma *corticola*, Zw. *virescent* or *cinereo-virescent, minutely furfuraceo-granulate*, thin, effuse; *apothecia pale-rufous or fuscous*, blackish, small, sessile.

On Myrica Gale, rare. 1877.

EXS :—Zw. 417. Nyl. Paris. 136. Lojka Transylv. 2208.
BOT. PROV :—7.
WALES :—Llyn Gwernan! (1877.)

*H. Spores multiseptate.*

321. *L. pachycarpa*, (Duf.) *creamy-yellow*, sub-tartareous, *thickish*, effuse, *pulverulento-furfuraceous; apothecia large*, scattered, *adnate, reddish-brown*, plane or tumid, *margin paler, obtuse; hypothecium pale-yellowish-brown; spores* 1, very large, colourless, elongato-oblong or cylindrical, 10-septate.

On trees, rare. 1806.

SYN :—Dufour in Fries L. Eur. 259. (1831.) Nyl. Prod. 118. Mudd Man. 189.
FIG :—E. Bot. 1683. Hepp Sporen t. 27. f. 234.
EXS :—Zw. 80.
GEOG. DISTRIB :—Switzerland, Bavaria, France.
BOT. PROV :—1, 2...5...7, 8...19.
ENGLAND :—New Forest! *Mr. Lyell.* (1806.) Sussex. *Mr. Turner.* Tilgate Forest and St. Leonard's Forest! Sussex. *Mr. Borrer.* Charnwood Forest. *Rev. A. Bloxam.* Stoke Wood, Devon. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* near Hastings. *Rev. J. M. Crombie.* Old Woods in Sussex. *Mr. Sowerby.*
IRELAND :—Cromaglawn, Killarney! *Dr. Moore.* Castlebernard co. Cork; Dinis, Killarney. *Mr. Carroll.*
WALES :—Cwm Bychan! *Rev. T. Salwey.*
"Spores .018—.025 in. long by .007 in. broad." (*Mudd.*) "Spores .070—140 mm. long, .025—35 mm. broad. Spermatia straight .003—.0035 mm. long, .001 mm. broad, fixed on shortish simple sterigmata." (*Nyl.*) Hypothecium very thin, pale-yellowish-brown, resting on a white thickish medullary stratum, the whole being enclosed in a thicker browner horny excipulum. Spore immense .160 mm. long, .036 mm. broad.

322. *L. homalotropa*, Nyl. *white*, glabrous, very thin or *albo-macular*, sub-determinate; *apothecia black*, moderate, plane, margined; *hypothecium thin, nigricant;* epithecium *sub-rugose*, dusky; spores 8, colourless, cylindrical, closely multiseptate; paraphyses slender, anastomosing; gelatina hymenea untinged with iodine.

On old ash trees in sub-alpine regions, rare. 1867.

SYN :—Nyl. in Flora 1867. p. 329. Crombie En. 90.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Near Derrycunihy, and Eagle's Nest, and between Killarney and Kenmare. (1867.); and on Mc Carthy Island in upper lake of Killarney. *Mr. Carroll.*
Near to *L. urceolata*, Ach. Doubtful if not both referable to *Melaspilea*. "Spores .130—.140 mm. long, .0045—.0050 mm. broad." (*Nyl.*)

323. *L. urceolata*, Ach. *glaucous-white or sub-cinerascent*, smooth, *rugoso-rimose*, cartilaginous, *nigro-limitate; apothecia black, urceolate*, sessile, *prominent, externally albo-pruinose, margin thick, elevated;* hypothecium horny, livid; *spores colourless, elongato-cylindrical, maggot-like*, 13-*septate, constricted at the septa, arcuate.*

On trees, rare.

SYN :—Ach. Lich. p. 671. (1810.) Syn. p. 27. *Conotrema urceolatum*, Tuck. Syn. Lich. N. Am. 86.
FIG :—Hals. Lich. N. Y. t. 1, f. 1.
EXS :—Zw. 300. Crombie 95.
GEOG. DISTRIB :—Europe, N. America.
BOT. PROV :—15.
SCOTLAND :—Airds, Appin ! *Rev. J. M. Crombie.*
Spores .055 mm. long, .006 mm. broad.

324. *L. milliaria*, Fr. *cinereo-nigrescent, coarsely granulose*, effuse; (K yellow C orange red); *hypothallus nigro-fuscous; apothecia black, crowded*, sessile, *convex*, almost sphærical, immarginate; *hypothecium nigrescent;* spores 8, colourless, *narrowly fusiformi-cylindrical, obtuse at the apices*, almost sub-cylindrical, multiseptate.

forma *terrestris*, Fr.

On the earth, common.

SYN :—Fr. L. Eur. 342. (1831.) Nyl. Scand. 205. Mudd Man. 188.
EXS :—Leight. 238.
GEOG. DISTRIB :—Scandinavia, Germany, Africa, America.
BOT. PROV :—1, 2, 3...5...7...10...12, 13...15...(19...26...30)...31.
ENGLAND :—Guisbro' Moor ! Cleveland. *Mr. Mudd.* Cumberland. *Mrs. Stanger.* Starcross, near Torquay. *Mr. Parfitt.* Tiptree Heath, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* Toy's Hill, Kent. *Mr. Holmes.* Caer Caradoc ! Long Mynd ! Shropshire.
SCOTLAND :—Ayrshire ! *Mrs. Dobie.* Ben Lawers ; Blair Athole ; Banchory near Aberdeen. *Rev. J. M. Crombie.*
IRELAND :—Not uncommon. *Mr. Carroll.* Kylemore Castle ! Dawros river ! Letter Hill ! co. Galway. *Mr. Larbalestier.*
WALES :—Aber ! Corwen ! Pass of Llanberis ! near Dolgelley ! Cader Idris !
CHANNEL ISLANDS :—Jersey ; Guernsey. *Mr. Larbalestier.*

Var. *montana*, Nyl. *cinerascent* or *whitish, slightly granulose;* apothecia black, nigricant within; *spores* narrowly fusiform, obtuse at the apices, almost sub-cylindrical, multiseptate.

On mosses in mountain ranges, frequent.

SYN :—Nyl. Scand. 205. (1861.)
EXS :—Leight. 386. 388. Zw. 121. Mudd 156. Bohl. 85.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—5...7...10...12, 13...22.
ENGLAND :—Guisbro' Moor ! Cleveland. *Mr. Mudd.* Cumberland ! *Mrs. Stanger.* Caer Caradoc ! Long Mynd ! Shropshire.
SCOTLAND :—Ayrshire ! *Mrs. Dobie.*
IRELAND:—Co. Wicklow. *Dr. Moore.* between Letterfrack and Dawros Bridge ! Galway. *Mr. Larbalestier.*
WALES :—Cader Idris ! Pass of Llanberis !

Var. *syncomista*, Flk. *thallus granuloso-squamulose, squamules concrescent, crenato-lobate;* apothecia black; hypothecium nigricant; spores 8, colourless, narrowly fusiformi-cylindrical, obtuse at the apices, multiseptate.

On sandy earth, rare.

SYN :—Flk. in Berl. Mag. 3. 310. (1808.) Nyl. Scand. 205.
EXS :—Anzi Langob. 148. Larbal. 82.
GEOG. DISTRIB :—Europe.
BOT. PROV :—8...15...31.
ENGLAND :—Deep Dale, Buxton. *Dr. Holl.*
SCOTLAND :—Ben Lawers. *Dr. Holl.* Craig Tulloch. *Rev. J. M. Crombie.*
CHANNEL ISLANDS :—Quenvais ! Jersey. *Mr. Larbalestier.*

forma *ligniaria*, (Ach.) *greyish-green, granulate, subleprose; apothecia* black, crowded, and *confluent*, immarginate.

On dead wood and trees.

SYN :—Ach. Univ. 169. Syn. 26. Mudd Man. 188.
EXS :—Zw. 122. 276. Mudd. 158. Anzi Ital. 259. Arn. 348. 167 b.
GEOG. DISTRIB :—Europe.
BOT. PROV:—10.
ENGLAND :—Baysdale ! Cleveland. *Mr. Mudd.*

forma *saxigena*, Leight. greyish-green or greyish-brown, granulate, often evanescent.

On sandstone rocks, frequent.

SYN :—Leight. Exs. 210. Mudd Man. 188.
EXS :—Leight. 210. Mudd 157. Hepp 510. Arn. 167.
GEOG. DISTRIB :—Europe.
BOT. PROV :—3...5...7...10...26.
ENGLAND :—Lounsdale ! Cleveland. *Mr. Mudd.* Leith Hill ! Surrey. *Mr. Joshua.* Nesscliffe ! Hopton ! Stableford ! Grinshill !
IRELAND :—Lough Muck ! Letter Hill ! Dawros Bridge ! Galway. *Mr Larbalestier.*
WALES :—Cader Idris !

Var. *endoleuca*, Leight. *albido-cinerascent*, minutely and scatteredly *granuloso-squamulose ;* apothecia black, convex, immarginate ; *hypothecium colourless ;* spores 8, colourless, narrowly fusiformi-cylindrical, obtuse at the apices, 3-5-septate.

On mosses in bogs. 1875.

BOT. PROV :—26.
IRELAND :—Bogs near Kylemore ! Doughruagh Mountain ! co. Galway. *Mr. Larbalestier.* (1875.)
Spores .016—.018 mm. long, .004 mm. broad,

325. *L. phacodes*, (Körb.) *glaucescent, scattered, granulose*, effuse ; *apothecia pale-yellow-flesh-coloured*, minute, numerous, scattered, sessile, convex, immarginate ; *hypothecium colourless ;* spores 8, colourless, cylindrical or aciculari-cylindrical, multiseptate (7-septate).

On trees, rare.

SYN :—*Bacidia*, Körber Par. 130. (1865.) Crombie En. 73.
EXS :—Anzi Etr. 25. Zw. 340. 339.
GEOG. DISTRIB :—Germany, Italy, Bavaria, Sweden.
Spores .027—.034 mm. long, .003—.005 mm. broad. K and C when applied consecutively, manifest a marginal thin dark line around the apothecia.

forma *chlorotica*, Ach. *pulverulento-granulose, virescent* ; apothecia pale-yellow.

On trees, *Thymus Serpyllum, Ulex Europæus, Calluna vulgaris, Elm*, rare. 1851.

SYN :—Ach. L. U. 196. (1810,) Crombie En. 73.
GEOG. DISTRIB :—Switzerland.
BOT. PROV :—2, 3...7...10...19...24...26...31.
ENGLAND :—Thirsk ! Yorkshire. *Mr. Baker.* (1851.) New Forest. *Rev. J. M. Crombie.* Thame Park Oxfordshire. *Mr. Larbalestier.*
IRELAND :—Dunscombe's Wood, Cork ; Muckruss demesne and Island in Upper Lake, Killarney ; Castleconnel and Tervoe, Limerick ; Killaloe, Clare. *Mr. Carroll.* Killery Bay. *Mr. Larbalestier.* (saxicole) Lough Feagh.
WALES :—Fort Hill ! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—Noirmont ! Jersey. *Mr. Larbalestier.*

326. *L. saxigena*, Uloth. *greyish-green granuloso-pulverulent ; apothecia black, hemisphærical*, prominent, sessile ; *hypothecium colourless ;* paraphyses distinct, cohærent, *spores* 8, *colourless, fusiform*, 3-5-*septate.*

On rocks, rare. 1876.

BOT. PROV :—7...26.
IRELAND :—Doughruagh Mountain ! *Mr. Larbalestier.*
WALES :—Dolgelley !

327. *L. leucophæopsis*, Nyl. *white, squamulose, squamules* small, rotundato-difformed, adnate, *depressed in the centre*, dispersed or contiguous, (K yellow C yellow) ; apothecia brownish-black, opake, convex, concolorous within ; hymeneal stratum dark-greyish ; *spores* 6 or 8, colourless, *fusiform, generally* 3-*septate* but sometimes 4-5-6-*septate* ; paraphyses slender, distinct, entangled ; epithecium and *hypothecium yellowish-brown* ; gelatina hymenea bluish and thecæ vinous-red with iodine.

On quartzose stones, rare. 1872.

SYN :—Nyl. in Flora 1873. p. 20. Crombie in Grevillea 1. 141.
BOT. PROV :—15.
SCOTLAND :—Plentiful, but rare in fruit on Ben Lawers ! *Rev. J. M. Crombie.* (1872.)
"Spores .024—34 mm. long, .005—8 mm. broad." (*Nyl.*) Spores .027—.036 mm. long, .006 mm. broad.

328. *L. sabuletorum*, Flk. *albido-cinerascent*, thin, *granuloso-squamulose*, effuse ; *apothecia pallido-fuscescent* or *fuscous* or *fusco-nigricant*, convex ; *hypothecium slightly brown upwards, otherwise pale ; spores* 8, colourless, *broadly fusiform*, acute at the apices, 5-septate.

On decayed mosses on walls, frequent.

SYN :—Flk. in Berl. Mag. 1808. p. 309. Nyl. Scand. 204.
FIG :—Mass. Ric. f. 234. Hepp Sporen t. 16. f. 138.
EXS :—Larbal. 81. Hepp 138.
GEOG. DISTRIB :—Sweden, Germany, France.
BOT. PROV :—3...5, 6, 7...15...19...26...31.
ENGLAND :—Oswestry ! *Rev. T. Salwey.* Shoreham Churchyard ; Tilgate Forest, Sussex. *Mr. Larbalestier.* Maidstone, Kent. *Mr. Holmes.* near Oxford. *Mr. Larbalestier.* near Cirencester. *Mr. W. Joshua.* Sundorne ! Holly Park ! near Stokesay. Llanymynech Hill ! Stiperstones ! Shifnal ! Shropshire.
SCOTLAND :—Near Aberdeen. *Rev. J. M. Crombie.*
IRELAND :—Middle Road ! near Blackpool ! co. Cork. *Mr. Carroll.* Salrock ! Ballynakill Churchyard walls ! Galway. *Mr. Larbalestier.*
WALES —Near Dolgelley ! Caswell Bay ! Mumbles.
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*
"Spores .020—38 mm. long, .006—8 mm. broad. Spores .018—34 mm. long, .006—8 mm. broad." *(Nyl.)* Spores .028—.033 mm. long, .006—.007 mm. broad.

Var. *Dufourei*, (Ach.) spores 1-septate, Nyl. in Flora 1867, p. 373. *f. simplicior*, Nyl. Scand. 205. has occurred on Cader Idris ! 1866, on moss and earth. Crib Coch ! Snowdon. Spores .016 mm. long, .0055 mm. broad. (K—C—) Hypothecium colourless.

And also another var. *monophragmia*, Nyl. in litt. is mentioned as collected at Morrone, Braemar in Crombie En. 71.

329. *L. premnea*, Ach. *cinerascent or cinereo-virescent*, very thin, effuse, (K—C—) ; *apothecia black*, opake, *naked* or *virescenti-pruinose*, moderate, plane, *margin* thin, prominent, *flexuose* ; hypothecium black ; spores 8, colourless, oblongo-or broadly-fusiform, apices acute, 5-septate.

On old trees, frequent. 1785.

SYN :—Ach. L. U. 173. (et var. *taxicola*, 671.) (1810.) Syn. 17. Nyl. Scand. 241. Mudd Man. 222.
FIG :—E. Bot. 1682. Leight. Ang. Lich. t. 28. f. 3.
EXS :—Bohl. 101. Mudd 197. Leight. 124. Hepp 514.
GEOG. DISTRIB :—Switzerland, Germany, France, Java.
BOT. PROV :—1, 2, 3, 4, 5...7...10, 11, 12...19...24 ..26 31.
ENGLAND :—Epping Forest. *Afzelius.* Plymouth. *Mr. Holmes.* Hill Beck, Westmoreland. *Rev. J. Harriman.* Suffolk. *Rev. Mr. Leathes.* North of England. *Dr. Dickson.* (1785.) near Bristol. *Miss Attwood.* Kildale ! Cleveland. *Mr. Mudd.* Middleton lane ! Oswestry. *Rev. T. Salwey.* near Worcester. *Dr. Holl.* Red Hills, Exeter. *Mr. Parfitt.* Rivenhall ; Kelvedon ! Mark's Hall, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* Tunbridge Wells. *Mr. Jenner.* Penshurst ! Porlock, Kent. *Mr. Holmes.* Brampton Brian Park ! Herefordshire ; Downton Castle Woods ! Stableford ! Shropshire.
IRELAND :—Curraghmore. *Adm. Jones.* Castlebernard Park and Kilbrittain near Bandon ; Adare Abbey, Limerick. *Mr. Carroll.*
WALES :—Nannau. *Mr Holmes.*
CHANNEL ISLANDS :—Guernsey ; La Moye, Jersey. *Mr. Larbalestier.*
"Spores .0045 to .005 in. long, by .001 in. broad." (*Mudd.*) "Spores .018—25 mm. long, .005—7 mm. broad. Gelatina hymenea I pale-vinoso-fulvescent or rubescent." *(Nyl.)* Spores .019—.026 mm. long, .0055—.006 mm. broad.

forma *saxicola*, Leight. *greyish-green*, thin, *granuloso-leprose*, effuse ; *apothecia black*, sessile, numerous, *virescenti-pruinose*.

On sandstone rocks, not uncommon. 1837.

SYN :—Leight. Exs. 185. Mudd Man. 222.
EXS :—Leight. 185. Zw. 15. 301. Nyl. 67. Mudd 198. Hepp 515. Arn. 292. Rabh. 895.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5 ..7...10...26.
ENGLAND :—Airyholme Wood ! Cleveland. *Mr. Mudd.* Nesscliffe ! Shropshire.
IRELAND :—Doughruagh Mountain ! Galway. *Mr. Larbalestier.*
WALES :—Between Arddog and Ynysfaig ! *Rev. T. Salwey.* (1837.)

forma *teichogena*, Nyl. sub-ecrustaceous , apothecia black, plane, naked, margined.

On brick walls.

ENGLAND :—Lele Monachorum ! Devon. *Mr. Larbalestier.*

forma *crenatula*, Nyl. evanescent ; apothecia black, plane, naked, margin flexuose, somewhat crenulate.

On sandstone rocks, rare. 1867.

CHANNEL ISLANDS :—La Moye ! Jersey. *Mr. Larbalestier.* (1867.)

330. *L. farinosa*, (Ach.) *white, powdery*, unequal, thin, sometimes sub-granulose, (K—C—) ; *apothecia black, albo-pruinose*, plane or sub-convex, small ; *hypothecium nigricant ; spores* 8, colourless, *fusiform*, 3-5-septate.

On old trees, not common.

SYN :—Ach. L. U. 187. (1810.) Syn. 32. Nyl. Scand. 240. *Lecanactis illecebrosa*, Fr. L. E. 376. *Lichen amylaceus*, Ehrh. *Schismatomma amylaceum*, Mudd Man. 222. (in part).
EXS :—Schær. 627. Zw. 124. Hepp 533.
FIG :—Hepp Sporen t. 62. f. 533.
GEOG. DISTRIB :—Switzerland, Germany, Sweden, Hungary.
"Spores .016—21 mm. long, .003—4 mm. broad. Gelatina hymenea I vinoso-fulvo-rufescent." *(Nyl.)* Spores .018—.021 mm. long, .002—.003 mm. broad. Gelatina hymenea I blue then reddish-brown.

331. *L. carneo-albens*, Nyl. *glauco-virescent*, thin, *granulose*, indeterminate, *(K yellow C red) ; apothecia fleshy-white*, somewhat

*convex, immarginate*, internally colourless; hypothecium colourless; paraphyses distinct, branched towards the colourless apices; spores 8, colourless, elongato-fusiform, 7-septate.

On inundated rocks, very scarce. 1876.

SYN :—Nyl. in Flora 1876. p. 307.
BOT. PROV :—26.
IRELAND :—Killery Bay! Connemara. *Mr. Larbalestier.* (1876.)
Spores .0295 mm. long, .004 mm. broad. "Sporæ bacillares subrectæ 3-5-septate .023—27 mm. long, .0025—.0035 mm. broad. Gelatina hymenea I fulvorubescent especially the thecæ whose apices are at first blue." (*Nyl.*)

332. *L. lubens*, Nyl. *greyish-glaucous*, granulose, effuse; *apothecia pale-flesh-coloured* or *livid-brownish*, small, numerous, crowded, at length convex; *hypothecium fuscescent;* paraphyses cohærent, apices colourless; *spores* 8 *or very variable in number, colourless, fusiform*, 5-9-*septate*; gelatina hymenea I deep-bluish.

On trees, near the roots, rare. 1874.

SYN :—Nyl. in Flora 1874. p. 311.
BOT. PROV :—3.
ENGLAND :—Shere! Surrey. *Rev. J. M. Crombie.* (1874.)
"Spores 0.028—50 mm. long, 0.007—0.011 mm. broad. Allied to *L. sabuletorum, var. amœna*, Ohl. but differing in character of spores." (*Nyl.*) Spores .039—.042 mm. long, .006—.007 mm. broad.

333. *L. subretusa*, Strn. *whitish or evanescent; apothecia black*, moderate, *convex, immarginate; hypothecium fuscous-black or fusco-rufous; spores* 8, *colourless, fusiform*, 3-9- (generally 7-) *septate;* paraphyses not well discrete, almost conglutinate, cærulescent at the apices.

On *Weissia compacta*, rare. 1871.

SYN :—Stirton in Grevillea 3. p. 24. (1874.)
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Dr. Stirton.* (1871.)
"Spores .045—.06 mm. long, .01—.012 mm. broad. Allied to *L. sabuletorum.*" *(Stirt.)* "Possibly this may be *Lecidea accedens*, Arn. or an old state of *Lecidea sabuletorum*," (Crombie in Grevillea 3. 143.)

334. *L. carneo-glauca*, Nyl. *glaucous-green*, thin, opake, *subleprose*, whitish, limitate, (K—C—); *apothecia sordid, or pale-flesh-coloured, convex, immarginate, whitish within*; *hypothecium colourless*; paraphyses slender, not very well discrete; *spores* 8, *colourless, attenuato-fusiform*, 1-5-*septate.*

On siliceous maritime rocks, very rare.

SYN :—Nyl. in Flora 1873. p. 295.
BOT. PROV :—31.
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .025—40 mm. long, .0030—35 mm. broad. Gelatina hymenea I bluish then tawny. Spermogonia pale, urceolate, spermatia oblong." (*Nyl.*)

335. *L. citrinella*, Ach. *citrine or bright-flavo-virescent, granulose, pulverulent*, effuse; *apothecia black, appressed*, solitary or *conglomerate*, margin thick, obtuse; hypothecium nigro-fuscous; *spores* 8, colourless, slender, *elongato-acicular, multiseptate, cells containing oily globules.*

On earth and mosses amongst mountains, frequent. 1793.

SYN :—Ach. Kongl. Vet. Acad. N. H. 16. 135. (1795.) Syn. 25. Nyl. Scand. 248. Mudd Man. 186.

FIG :—E. Bot. 1877. Sturm Fl. Germ. t. 31. Mudd Man. t. 3. f. 70.
EXS :—Leight. 303.
GEOG. DISTRIB :—Sweden, Bavaria, Transylvania.
BOT. PROV :—1...5...7...11, 12, 13...15...19...22...26.
ENGLAND :—Cumberland ! *Mrs. Stanger.* Oswestry ! *Rev. T. Salwey.* Teesdale ! *Mr. Robertson.* Hay Tor, Dartmoor. *Dr. Holl.* Cox Tor ! Devon. *Mr. Curnow.*
SCOTLAND :—Ayrshire ! *Mrs. Dobie.* Ben Lawers. *Dr. Maingay.* Glen Fender ; Craig Tulloch ; Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—Bonane ! and Kilceanagh co. Kerry. *Dr. Taylor.* co. Wicklow. *Dr. Moore.* Doughruagh Mountain ! co. Galway. *Mr. Larbalestier.*
WALES :—Cader Idris. *Dr. Holl.* Bettws-y-coed. *Mr. Holmes.* Llangollen ! Builth ! Trefriw ! Craig Dhu ! near Criccieth.
"Spores .014 to .019 in. long, by .00075 in. broad." (*Mudd.*) "Spores .036—.100 mm. long, .003—4 mm. broad." Gelatina hymenea I—." (*Nyl.*) Spores .056—.061 mm. long, .003—.004 mm. broad.

336. *L. carneola*, Ach. *whitish* or granuloso-pulverulent, *evanescent ; apothecia rufous or carneo-fuscescent*, small, *adnate*, somewhat *concave* or sub-urceolate, *margin thick*, elevated, *pale* ; hypothecium pale, excipulum lateral, pale-brown ; *spores* 8, colourless, elongato-acicular, multiseptate, (13-septate) *large.*

On trees, oak, beech, rare. 1794.

SYN :—Ach. L. U. 194. (1810.) Syn. 42. Nyl. Scand. 191. Mudd Man. 182.
FIG :—With. 4. t. 31. f. 3. E. Bot. 965. Leight. Ang. Lich. t. 14. f. 4.
EXS :—Leight. 117. Anzi It. S. 261. Zw. 192. Nyl. 132. Hepp 521. Mass. 269.
GEOG. DISTRIB :—Germany, Italy, France, Switzerland, Sweden, N. America.
BOT. PROV :—1, 2...5 7, 8...10, 11...19...31.
ENGLAND :—Eggleston, Durham. *Rev. J. Harriman.* Studley Wood near Ripon. *Mr. Brunton.* Twycross ! Leicestershire. *Rev. A. Bloxam.* Sussex ! *Mr. Borrer.* Tilgate Forest ! Sussex. *Mr. Larbalestier.* Bolton. *Dr. Carrington.* near Lyndhurst in New Forest. *Rev. J. M. Crombie.* Blackstone rock, Devon. *Mr. Parfitt.* Ugbrooke Park, Rova and Penn Woods near Ilsington, Devon. *Messrs. Jones & Kingston.* Park, Cirencester. *Mr. W. Joshua.* Haughmond Hill ! Shropshire.
IRELAND :—Dinis, Killarney. *Mr. Carroll.*
WALES :—Garn near Denbigh. *Mr. Griffith.* (1794.) Bettws-y-coed ! Trefriw !
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .008 to .012 in. long, by .00075 to .001 in. broad." (*Mudd.*) "Spores .058—.080 mm. long, .003—4 mm. broad. Gelatina hymenea I pale blue." (*Nyl.*) Spores .0645—.067 mm. long, .004 mm. broad.

337. *L. endoleuca*, Nyl. *greyish-white or pale-tawny*, thin, effuse, *smooth* or *granulose ; apothecia black*, scattered, sessile, *plane* or plano-convex, margin thick, smooth ; *hypothecium colourless* ; and excipulum dusky externally ; paraphyses distinct, apices nigricant ; hymenium bluish in section ; spores 8, colourless, elongato-acicular, multiseptate, (7-septate.)

On trees, ash, Ulex Europæus, alder, mountain-ash, Calluna vulgaris, frequent.

SYN :—Nyl. Obs. Holm. 2. 7. (1853.) Prodr. 114. Mudd Man. 183.
EXS :—Leight. 90. Bohl. 90.
GEOG. DISTRIB :—France, Sweden, Switzerland.
BOT. PROV :—1, 2, 3...5, 6, 7, 8...10...19...26...31.
ENGLAND :—Torquay ! Devon. *Dr. Deakin.* Oswestry ! *Rev. T. Salwey.* Twycross ! *Rev. A. Bloxam.* Airyholme Wood ! Hoggarts Wood, Cleveland. *Mr. Mudd.* Hilk's Wood, Ingleborough. *Dr. Carrington.* near Thirsk. *Mr. Baker.* Essex ! *Mr. Piggott.* near Lewes, Sussex. *Mr. Larbalestier.* Haldon and Budleigh Salterton. *Mr. Parfitt.* near Bath ; Churchill near Worcester. *Dr. Holl.* Kelvedon ; Mark's Hall ; Braxted ; Sible Headingham, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* Wrekin near Shrewsbury ! Shropshire.
IRELAND :—Lord Sligo's demesne, Westport ! co. Mayo ; Dawros river ! co. Galway. *Mr. Larbalestier.*

WALES :—Barmouth ! Builth ! Capel Arthog ! Fort Hill ! near Fishguard, Llanbedrog ! Pembrokeshire ; Gaer Ditches !
CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier.*
"Spores .052—68 mm. long, .004 mm. broad." (*Nyl.*) Spores .05 mm. long, .003 mm. broad.

forma *muscicola*, Nyl. On mosses, rare.

IRELAND :—Dinis Island, Killarney. *Mr. Carroll.* Banks of Lough Muck ! co. Galway. *Mr. Larbalestier.*
WALES :—Dolgelley !

338. *L. intermedia*, Hepp. *whitish*, thin, unequal ; *apothecia rosy-flesh-colour*, moderate, somewhat plane, obtusely margined (when moist corneo-hyaline) ; *epithecium and hypothecium colourless* ; paraphyses slender ; *spores* 8, *colourless*, acicular, 5-7-*septate*.
On elm, rare. 1877.

SYN :—Nyl. Lapp. Or. 184. (1866.)
FIG :—Stizenb. Nadelf. Sp. p. 42. t. 2. f. 17.
GEOG. DISTRIB :—E. Lapland.
BOT. PROV :—26.
IRELAND :—Lord Sligo's demesne, Westport, co. Mayo. *Mr. Larbalestier.* (1877.)
"Spores .042—52 mm. long, .0020—.0025 mm. broad. Gelatina hymenea I blue then vinous-red." (*Nyl.*)

339. *L. Leightoniana*, Larbal. *virescent*, thin, tartareous, effuse, *granulato-furfuraceous*, somewhat rimulose ; *apothecia livido-rufous*, moderate, scattered, sessile, plane, *with a thickish pale persistent margin ; hypothecium pale-dusky-brown, subtended by a colourless horny excipulum* ; paraphyses distinct, apices colourless ; *spores* 8, *colourless, excessively slender, elongato-acicular*, 7-9-*septate, arcuate*.
On damp rocks, rare. 1877.

SYN :—Larbalestier in litt. 1877.
BOT. PROV :—26.
IRELAND :—Near Lough Feagh ! *Mr. Larbalestier.* (1877.)
Spores .054 mm. long, .002 mm. broad.

340. *L. scopulicola*, Nyl. *greyish-grey, verrucoso-unequal*, thinnish, effuse ; apothecia *brownish-flesh-coloured, at first obtusely margined*, when old convex ; *spores* 8, *colourless, acicular, thinly or obsoletely* 3-5-*septate* ; paraphyses slender ; epithecium colourless ; *hypothecium colourless, (but tawny brown in the sub-hymeneal stratum) ;* gelatina hymenea I bluish and then tawny-vinous-red.
On maritime rocks. 1874.

SYN :—Nyl. in Flora 1874. 312.
BOT. PROV :—1.
ENGLAND :—Near Penzance, Cornwall. *Mr. Curnow.* (1874.)
"Spores 0.032—44 mm. long, 0.002 mm. broad." (*Nyl.*)

341. *L. polysita*, Stirtn. *cinereous or pale-cinereo-fuscescent*, thickish, *squamulose or squamuloso-concrete*, squamulæ crenulate or sometimes somewhat concave, (K—C—) ; *apothecia fuscous or fuscous-black*, sessile, somewhat plane, *immarginate*, at length convex and prominent ; *hypothecium luteo-rufescent, thick, or in a thick lamina fuscous or nigro-fuscous, K purple and also the inferior portion of the hymenium ;* paraphyses distinct, apices colourless, not clavate ; *spores* 8, *colourless, acicular or somewhat bacillar, straight*, 3-11-*septate*.

On old dead bark, rare. 1874.

SYN :—Stirton in Scott. Naturalist 4 p. 28. (1877.)
BOT. PROV :—16.
SCOTLAND :—Near Ben Brecht, Argyleshire. *Mr. Paterson.* (1874.)

342. *L. rosella*, (Pers.) *cinerascent*, thin, *unequal* or *granulose; apothecia rose-coloured or flesh-coloured, subpruinose*, moderate, numerous, scattered, sessile, plane, margin thick, obtuse, pale; *hypothecium* and excipulum colourless or pale-yellow; spores 8, colourless, bacilliform, multiseptate.

On trees, rare. 1806.

SYN :—Persoon in Ust. Ann. 7. 25. (1794.) Ach. Meth. 57. Nyl. Scand. 208. Mudd Man. 181.
FIG :—E. Bot. 1651. Hepp Sporen t. 60. f. 522.
EXS :—Schær. 217. Hepp 522. Zw. 231. Stenh. 136. Reich. & Schub. 55.
GEOG. DISTRIB :—Sweden, Germany, Switzerland, Hungary, Bavaria, Austria.
BOT. PROV :—2...5...10...15.
ENGLAND :—New Forest. *Miss Biddulph.* (1806.) near Ripon, Yorkshire. *Mr. Brunton*, near Hastings, Worcester, and Malvern. *Dr. Holl.* Chelsfield, Kent. *Rev. J. M. Crombie.*
SCOTLAND :—Highlands. *Mr Turner.*
"Spores .015 to .018 in. long by .00075 to .001 in. broad." *(Mudd.)* "Spores .068—98 mm. long, .0045—.005 mm. broad." *(Nyl.)* "Spores .060—100 mm. long, .004—5 mm. broad." *(T. M. Fries.)* Paraphyses slender, cohærent, apices pale-yellow-brown. Gelatina hymenea I blue. Spores .059 mm. long, .0035 mm. broad. Thallus and apothecia K yellow C yellow.

343. *L. rubella*, (Ehrh.) *yellowish or greyish-green*, thin, effuse, *minutely squamuloso-granulate; apothecia luteo-rufescent or reddish-flesh-coloured*, moderate, numerous, scattered, or congregate, sessile, plane or convex, margin thin, smooth, obtuse; *hypothecium pale-yellow*; spores 8, colourless, bacilliform, multiseptate.

On trees, especially elm, frequent. 1801.

SYN :—Ehrhart Pl. Crypt. 196. (1785.) Mudd Man. 182. *Lecidea luteola*, var. *a*, Ach. Syn. 41. Nyl. Scand. 209. *L. porriginosus*, Turn ! Linn. Trans. 7. 94.
FIG :—E. Bot. 845. Hepp Sporen t. 16. f. 141.
EXS :—M. & N. 641. Schær. 210. Nyl. 55. Leight. 92. Fries L. S. 197. (fide Nyl.) Anzi Etr. 23. Hepp 141. Bohl. 91.
GEOG. DISTRIB :—Switzerland, France, Hungary, Austria, Italy, Germany Sweden, Denmark, Norway, Finland.
BOT. PROV :—1...3...5...10...15...19, 20...24 ..28 ..30, 31.
ENGLAND :—Ingleby ! Kildale ! Ayton ! Yorkshire. *Mr. Mudd.* Essex ! *Mr. Piggott.* Torquay. *Dr. Deakin.* near Malvern, and Kempsey near Worcester. *Dr. Holl.* Haldon, Exeter. *Mr. Parfitt.* Kelvedon; Aldham, Essex, *Mr. Varenne.* Chelsfield, Selling, Chilstone Park, Kent. *Mr. Holmes.* Holton Park ! Tetsworth ! Thame, Oxfordshire. *Mr. Larbalestier.* Cadgwith near the Lizard, Cornwall. *Mr. Curnow.* Bourton on the Water. *Mr. W. Joshua.* Shelton Rough ! near Shrewsbury; Worfield ! Shropshire.
SCOTLAND :—Aberfeldy. *Dr. Holl.*
IRELAND :—Castlemartyr co. Cork; Carrigogunnel and Adare, Limerick. *Mr. Carroll.* Curraghmore, Waterford. *Adm. Jones.* Glenarm. *Dr. Moore.* Shanis Castle, co. Antrim. *Mr. Wright.* Lord Sligo's demesnes, Westport ! Mayo. Dawros river ! co. Galway. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Sark ! *Rev. T. Salwey.*
"Spores .014 to .018 in. long, by .00075 in. broad. Spermatia very fine and delicate, cylindrical, curved or undulate." *(Mudd.)* "Spores .058—100 mm. long, .003—4 mm. broad. Gelatina hymenea I blue then violet or vinous-red." *(T. M. Fries.)* "Spores .045—.075 mm. long, .003—.0045 mm. broad." *(Nyl.)* Thallus K slightly yellow C yellow, but does not affect the apothecia except by manifesting a dark circumferential very thin line.

344. *L. bacillifera*, Nyl. *evanescent*; *apothecia black, small*, scattered, plane, margin thickish; *hypothecium thick, horny, slightly brown*; *spores* 8, colourless, *bacilliform*, 6-septate.

On trees, rare. 1866.

SYN :—Nyl. in Mus. Fenn. 82. (1861.) Scand. 210.
EXS :—Fellm. 172. 173.
GEOG. DISTRIB :—E. Lapland, Sweden, Finland.
BOT. PROV :—7...24.
IRELAND :—Kilkee and Ross co. Clare. *Mr. Carroll.*
WALES :—Penmaen pool! near Dolgelley. (1866.)
"Spores .015—23 mm. long, .002—3 mm. broad." (*Nyl.*) Spores .042 mm. long, .0035 mm. broad.

Var. *alpina*, (Hepp.) grey, granuloso-concrescent, diffract; apothecia black, *internally white* or whitish; hypothecium *colourless*; spores 3-7-septate, straight.

On mosses and earth among alpine rocks, rare.

SYN :—Hepp fide Stizb. Lecid. nadelf. p. 15. (1863.) Nyl. Lapp. Or. 156.
FIG :—Stizb. l. c. t. 1. f. 2.
GEOG. DISTRIB :—E. Lapland.
BOT. PROV :—15...31.
SCOTLAND :—Morrone; Craig Guie, Braemar. *Rev. J. M. Crombie.*
CHANNEL ISLANDS—Herm. *Mr. Larbalestier.*

345. *L. muscorum*, (Sw.) *cinerascent*, very thin, *albido-granulose*, (K—C—); *apothecia black*, small, numerous, *crowded*, plane or sub-convex, margin obliterated; *hypothecium dark-fuscous*; *spores* 8, colourless, *bacilliform*, 3-7-*multiseptate*.

On mosses and earth, rare. 1785.

SYN :—Swartz. N. Act. Ups. 4. 245. (1776.) Nyl. Scand. 210. Lapp. Or. 155. Mudd Man. 184.
FIG :—E. Bot. 626. Relh. Fl. Cantab. 424. Nyl. in Bot. Notis. 1852. f. 4.
EXS :—Leight. 190. Mudd 152. Arn. 295.
GEOG. DISTRIB :—Sweden, Germany.
BOT. PROV :—4, 5, 6, 7, 8...10...15...19...23...31.
ENGLAND :—Gogmagog Hills, Cambridgeshire. *Rev. R. Relhan.* (1785.) Matlock Bath. *Sir J. E. Smith.* Buxton, Norfolk. *Mr. Turner.* Redcar! Cleveland. *Mr. Mudd.* near Bristol. *Miss Attwood.* Malvern Hills; Bath Hampton Downs. *Dr. Holl.* Yatton, Somerset. *Mr. Joshua.*
SCOTLAND :—Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—Middle road near Cork! *Mr. Carroll.* Malahide. *Dr. Carrington.*
WALES :—Tenby!
CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier.*
"Spores .006—.007 in. long, by .0005 in. broad." (*Mudd.*) "Spores .027—.040 mm. long, .0025—.0030 mm. broad. Gelatina hymenea I pale-blue then vinous-red" (*Nyl.*) Spores .0355—.040 mm. long, .0025—.003 mm. broad.

346. *L. effusa*, (Sm.) *yellowish-green, thin, crustaceous, rimose, scurfy; apothecia pale-yellow-flesh-coloured*, sessile, small, plane and with thickish margin or plano-convex and immarginate; hypothecium colourless; spores 8, colourless, bacilliform, 7-septate.

On trees, Ulex Europæus, not common. 1808.

SYN :—Smith! in E. Bot. 1863. (1808.)
FIG :—E. Bot. 1863. (in part.)
EXS :—Arn. 231. Zw. 370.
GEOG. DISTRIB :—Bavaria, Pyrenees, Germany, Normandy.
BOT. PROV :—2, 3...7...19...26...31.
ENGLAND :—New Forest! Hants. *Mr. Lyell & Mr. Borrer.* (1808.) Kelvedon; Braxted, Essex. *Mr. Varenne.*

IRELAND :—Sunday's Well Weirs, Cork. *Mr. Carroll.* near Letterfrack! Lough Feagh! *Mr. Larbalestier.*
WALES :—Pen-maen-mawr! Gloddaeth! Carnarvonshire.
CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier.*
Spores .035 mm. long, .003 mm. broad. K and C applied consecutively to the apothecia manifest a thin marginal line around the disk.

Var. *fuscella*, Fr. apothecia minute, numerous, sessile, convex and conglomerate, *fuscescent*.

On trees, ash, oak, poplar, common.

SYN :—Fr. S. V. S. p. 112. (1846).
EXS :—Leight. 211. 279. Nyl. 135. Zw. 88. 372. Mudd 148. Hepp 24.
GEOG. DISTRIB :—Sweden, Germany, Bavaria, France.
BOT. PROV :—2, 3...5...7, 8...10...24...28...31.
ENGLAND :—Sussex! *Mr. Borrer.* Gopsall! Leicestershire. *Rev. A. Bloxam.* Airyholme Wood! Cockshaw! Stokesley! Stogdale! Cliffrigg! Ingleby Park; Yorkshire. *Mr. Mudd.* Felix Hall Park! Kelvedon, Essex. *Mr. Varenne.* near Northleach, Gloucestershire. *Mr. W. Joshua.* Wrekin! Shropshire.
IRELAND :—Tervoe near Limerick. *Mr. Carroll.* Armagh. *Adm. Jones.*
WALES :—Bryn-y-Maelgwyn! Conway.
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

Var. *cæsio-pruinosa*, Mudd. apothecia *pale-bluish-green* colour.

On oaks, elder, rare.

SYN :—Mudd Man. 183. (1861.) *Bacidia cærulea*, Körb. *Biatora Fricsiana B.* (Hepp).
FIG :—Hepp Sporen t. 32. f. 288.
EXS :—Leight. 150. Mudd 150. Zw. 88. bis. Arn. 291. Hepp 746. Anzi Ven. 57.
GEOG. DISTRIB :—Germany, Hungary, Italy.
BOT. PROV :—3...5...8...10.
ENGLAND :—Stogdale! Yorkshire. *Mr. Mudd.* (1861.) Pirton, near Worcester. *Dr. Holl.* Chelmsford! *Mr. Piggott.* Gopsal! *Rev. A. Bloxam.* Sibertswold near Dover. Beechborough, Newington, Kent. *Mr. Holmes.* near Dursley, Gloucestershire. *Mr. Joshua.* Shere! Surrey. *Dr. Capron.* Sutton near Shrewsbury! Loppington! Shropshire.

Var. *inundata*, (Fries.) *tawny-virescent*, thin, *crustaceous*, *rimoso-areolate*, *scurfy*; *apothecia pale-brown*, minute, numerous, *sub-innato-sessile*, plano-convex, margin thin; hypothecium pale; spores 8, colourless, bacilliform, 7-septate.

On rocks in streams, rare.

SYN :—Fries L. Eur. 261. (1831.) Mudd Man. 183.
EXS :—Mudd 149. Zw. 235.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5, 6...10...19 . 26...31.
ENGLAND :—Airyholme Wood! Yorkshire. *Mr. Mudd.* Abdon! Shropshire.
IRELAND :—Sunday's Well Weirs, Cork. *Mr. Carroll.* near Kylemore Castle! Letterfrack! Mullaghglass! Galway. *Mr. Larbalestier.*
WALES :—Fishguard Harbour! Pembrokeshire.
CHANNEL ISLANDS :—Noirmont, Jersey. *Mr. Larbalestier.*
K and C applied consecutively manifest a thickish marginal ring around the disk of the apothecia.

Var. *delicata*, Larbal. apothecia *pale-rose*, *albo-pruinose*. Lough Feagh. *Mr. Larbalestier.* (1877.)

347. *L. caligans*, Nyl. *fuligineo-nigricant*, thin, *rugose*, *diffract*, indeterminate; *apothecia nigricant*, plane, *with an obtuse margin*, *internally pallescent*; hypothecium colourless, excipulum fuscescent

upwards; paraphyses indistinct, apices colourless; spores 8, colourless, *slenderly acicular*; gelatina hymenea I vinous-red.

On maritime rocks, very rare. 1873.

SYN:—Nyl. in Flora 1874. p. 10.
BOT. PROV:—31.
CHANNEL ISLANDS:—On a single block of stone near Fort Essex, Alderney. *Mr. Larbalestier.* (1873.)

348. *L. pulvinata*, (Tayl.) *pale-greenish-brown or cream-coloured, thickish, pulvinate, granuloso-squamulose, squamules* very minute, *congregate and pulvinate; apothecia black*, small, concave or plane, margin thick, obtuse, eventually convex and immarginate; hypothecium thick, dark-brownish-black; spores 8, colourless, acicular or sub-clavate, curved, multiseptate; paraphyses conglutinate.

On mosses in alpine places, rare. 1836.

SYN:—Tayl. Fl. Hib. 2. 123. (1836.)
GEOG. DISTRIB:—Europe.
BOT. PROV:—7...19...26.
ENGLAND:—Falcon Cliff, Teesdale. *Rev. T. Salwey.*
IRELAND:—Mangerton; Dereenafinchy Mountain, co. Kerry. *Dr Taylor.* (1836.) Brandon Mountain. *Dr. Moore.* west slope of Doughruagh Mountain! *Mr. Larbalestier.*
WALES:—Drws Ardudwy. *Rev. T. Salwey.* Llyn-y-Cae. *Mr. Holmes.* Barmouth! Aran Mowddwy!

349. *L. oribata*, Nyl. greyish-brown, thinly sub-granuloso-verruculose, spores 3-5-septate.

On the ground, in alpine regions, rare. 1873.

SYN:—Nyl. in Flora 1874. p. 16.
SCOTLAND:—Ben Lawers. *Dr. Stirton.* (1873.)
"Subspecies sit *subincompta*. Spores .023—40 mm. long, .003—4 mm. broad." (*Nyl.*)

350. *L. herbarum*, (Hepp) *ecrustaceous*; *apothecia rufescent*, moderate, plane, margined, or somewhat plane and margin evanescent; *hypothecium luteo-rufescent or lutescent, darker under the hymenium*; paraphyses slender, apices somewhat clavate, colourless; *spores* 8, *colourless, bacilliform, straight or sometimes flexuose, 5-7-septate.*

On the ground amongst rocks, rare. 1873.

SYN:—Stizb. Nadelf. p. 46. (1863.) Nyl. Lapp. Or. 155.
FIG:—Stizb. l. c. t. 2. f. 20.
EXS:—Arn. 290.
BOT. PROV:—31.
CHANNEL ISLANDS:—Sark. *Mr. Larbalestier.* (1873.)
"Gelatina hymenea I blue then dirty-vinous-red. Spores .038—48 mm. long, .0020—.0025 mm. broad." (*Nyl.*) Spores .039 mm. long, .0025 mm. broad.

### *I. Spores muralilocular.*

#### * *Hypothecium dark.*

351. *L. geographica*, (L.) *citrine or bright-yellow*, tartareous, *continuous, areolato-rimulose*, determinate, *nigro-limitate, areolæ plane or convex and tumid; apothecia* black, plane, small, scattered or confluent, *innate between or on the areolæ*; hypothecium black; spores 8, nigrescenti-fuscous, oblong, irregularly muralilocular.

On mountain rocks, common. 1795.

SYN :—Linn. Sp. Pl. No. 2. (1753.) Ach. Syn. 21. Nyl. Scand. 248. Mudd Man. 221.
FIG :—E. Bot. 245. Schær. En. t. 5. f. 3. Hoffm. Pl. Lich. t. 54. f. 2, excl. b. & c.
GEOG. DISTRIB :—Switzerland, Italy, Pyrenees, Norway, Scandinavia, Great Bear Lake.
BOT. PROV :—1...5...7...11...14...18...(19...30)...31.
ENGLAND :—On rocks. *Sir J. E. Smith.* (1795.) North of England. *Mr. Hudson.* Northumberland and Durham. *Mr. Winch.* Dartmoor. *Mr. Parfitt.* Malvern Hills; Stiperstones, Shropshire. *Mr. Purton.* Devon. *Mr. Holmes.* Lustleigh Cleve and Blackstone Rock, Devon. *Rev. J. P. Jones.* Haughmond Hill! Wrekin! Caer Caradoc!
SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay.* Long Island. *Prof. Balfour.*
IRELAND :—Mountainous districts. *Mr. Carroll.*
WALES :—Common.
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .005 to .007 in. long, by .0025 to .003 in. broad. Spermatia straight, cylindrical." *(Mudd.)* "Spores .027—40 mm. long, .011—13 mm. broad." (*Nyl.*) "Spores .022—36 mm. long, .011—18 mm. broad." (*T. M. Fries.*) Spores .027 mm. long, .012 mm. broad.

A most protean species, of which the following are the principal British forms :—

forma *contigua*, Schær. *citrine-yellow*, tartareous, *contiguous, areolato-rimulose, plane; apothecia black*, scattered or *chiefly confluent*, and *angulato-difformed, arising between the areolæ from the black hypothallus, plane, level with the areolæ, with a very thin sharp margin.*

On rocks, common.

SYN :—Schær. En. 106. Mudd Man. 221.
FIG :—Hoffm. Pl. Lich. t. 53. f. 6. and t. 54. f. 2. and d. Schær. En. t. 5. f. 3.
EXS :—Schær. 172. Anzi Ital. S. 302. A. Hepp 152. M. & N. 640. b.
GEOG. DISTRIB :—Switzerland, Italy.
BOT. PROV :—5...7.
ENGLAND :—Caer Caradoc! Shropshire.
WALES :—Cader Idris! Cwm Bochlwyd! Cwm Idwal! Aran Mowddwy! Capel Curig! Llyn Cwlyd!

forma *atrovirens*, (L.) *citrine-yellow, areolæ scattered, more or less distinct and dispersed, tumid, convex; apothecia black, plane or tumid*, with a thin margin, *arising from the black predominating hypothallus or from the areolæ.*

On rocks, not frequent.

SYN :—Linn. Sp. Pl. 1607. (1753.) Schær. En. 106. Nyl. Scand. 248.
FIG :—Hoffm. Pl. Lich. t. 17. f. 4.
EXS :—Hepp. 153. Arn. 512. c.
GEOG. DISTRIB :—Hungary, Germany, Switzerland.
BOT. PROV :—7...26.
IRELAND :—Dawros river! Galway. *Mr. Larbalestier.*
WALES :—Cwm Ffynnon Llugwy! Moel-y-gest! near Tremadoc.

forma *sphærica*, Schær. *greenish-yellow, verrucoso-areolate, areolæ* distinct or crowded, *tumid*, smooth; *apothecia black or brownish-black, round, protuberant, elevated above the level of the areolæ, convex, rough, immarginate*, arising from the black hypothallus or the areolæ.

On rocks, frequent.

Syn :—Schær. En. 106. (1850.) Mudd Man. 221. *viridulum*, Leight. L. Fl. 24. ed. 347.
Exs :—Leight. 93. Linds. 102. Anzi Ital. S. 305. Fw. 128.
Geog. Distrib :—Scandinavia, Italy, Germany, Nova Granada.
Bot. Prov :—5...7...10.
England :—Burton Head! Cleveland. *Mr. Mudd.* Hampstead Hill! Pontefract Hill! Caer Caradoc! Shropshire. Stanner Hill! Herefordshire.
Wales :—Moel Siabod! Barmouth! Moel-y-Golfa!

forma *areolata*, Schær. *citrine-yellow or greenish-yellow, areolate or areolato-rimulose, areolæ plane or tumid*, smooth; *apothecia black, round, more or less areolate, margin thick, smooth, prominent, entire or flexuose*, arising either from the black hypothallus or from the areolæ.

On rocks, common.

Syn :—Schær. En. 106. (1850.) Mudd Man. 221.
Fig :—Hoffm. Pl. Lich. t. 54. f. 2. a.
Exs :—Anzi Ital. S. 302. B. 302. Hepp 755. Fellm. 202. Schær. 623. Mass. 160. Mudd 196. M. & N. 640. c. Nyl. Pyr. Or. 47.
Geog. Distrib :—Vosges, Pyrenees, Italy, Germany, Arctic America, E. Lapland, Norway.
Bot. Prov :—5...7...10...15.
England :—Kildare Moor! Battersley! Cleveland. *Mr. Mudd.* Oswestry! *Rev. T. Salwey.* Stanner Hill, Herefordshire! Wrekin! Long Mynd! Shropshire.
Scotland :—Ben Lawers! Amulree! Birnam Hill! *Dr. Lindsay.*
Wales :—Llyn-y-Cae! Barmouth! Moel Siabod! Cwm Cywion! Moel-y-Golfa! Moel-y-Gest! Cwm Tryfaen! Conway! Capel Curig!

forma *cyclopica*, Nyl. *citrine-yellow, areolæ more or less scattered, elevato-convex, each ocellate with an apothecium; apothecia* blackish-brown, *more or less concave and sunken*, with a very thin margin, and *with a prominent thick thalline margin.*

On slate rocks, rare.

Syn :—Nyl. Scand. 248. (1861.)
Fig :—Hoffm. Pl. Lich. t. 54. f. 2. b. c.
Geog. Distrib—Sweden, Switzerland.
Bot. Prov :—7...15.
Scotland :—Ben Lawers, Perthshire. *Dr. Lindsay.*
Wales :—Moel-y-Gest! Barmouth! Aberdovey!

forma *gerontica*, (Ach.) *areolæ albo-sub-pulverulent*, plane or tumid, scattered or rimuloso-areolate; *apothecia black, plane.*

On mountain rocks, rare.

Syn :—Ach. Meth. 45. (1803.) Nyl. Scand. 248. *pulverulenta*, Schær. En. 106.
Exs :—Schær. 624.
Geog. Distrib :—Sweden, Norway, Italy.
Bot. Prov :—5...7...15, 16, 17.
England :—Long Mynd! Shropshire.
Scotland :—"In Scotiæ mediæ alpinis." *Rev. J. M. Crombie.*
Wales :—Aran Mowddwy!

352. *L. fecunda*, (Th. M. Fr.) *cinereo-virescent*, thickish, effuse, *furfuraceo-concrescent, apothecia black*, sessile, appressed, concave or plane, naked, margin thickish, flexuose; hypothecium nigro-fuscous; *spores* 8, *fuscescent*, oblong or ellipsoid, muralilocular.

On old posts, &c., rare. 1865.

Syn :—*Lopadium fecundum*, Th. M. Fr. Lich. Arct. 202. (1860.)
Geog. Distrib :—Finmark.

Bot. Prov :—5.
England :—Maddox Hill! near Wrekin, Shropshire. (1865.)

353. *L. pezizoidea*, Ach. *cinereo-fuscescent*, thin, *subsquamuloso-concrescent; apothecia fuscous-black*, elevated, somewhat concave, margin thin, inflexed, entire, paler; *hypothecium brownish-black*; spores 1, fuscescent, ellipsoid, murali-divided, large.

On mosses in alpine regions, rare. 1861.

Syn :—Ach. L. U. 182. (1810.) Syn. 26. Nyl. Scand. 212. Lapp. Or. 156. Mudd Man. 190.
Fig :—Hepp Sporen t. 56. f. 482.
Exs :—Zw. 342. Anzi Langob. 142. Hepp 482. Fellm. 167. Smrft. 43. Arn. 686.
Geog. Distrib :—Germany, Lombardy, Hungary, Bavaria, E. Lapland, Norway, Sweden, Finland.
Bot. Prov :—15.
Scotland :—Ben Lawers! *Adm. Jones.* (1861.)
"Spores .019 to .022 in. long, .006 to .009 in. broad." (*Mudd.*) "Spores .048—120 mm. long, .020—46 mm. broad." (*Th. M. Fr.*) "Spores .056—80 mm. long, .020—27 mm. broad. Spores .082—98 mm. long, .030—.038 mm. broad." (*Nyl.*)

354. *L. soreumidia*, Stirtn. *pale or pallido-cinereous*, thickish, *rugose or altogether verrucoso-congested*, fusco-limitate, (K—C—); *apothecia internally cinerascent*, crowded, *sessile, small*, at first plane, rugose, margined and *cæsio-pruinose*, at length convex, rugose, immarginate, and often connato-congested; *hypothecium fuscous or fuscescent;* paraphyses indistinct, somewhat irregular, apices fuscous, granuloso-inspersed; *spores* 8, *fuscous, ellipsoid, 3-septate and generally muralilocular.*

On dead wood, rare. 1874.

Syn : -Stirton in Scott. Naturalist 4 p. 29. (1877.)
Bot. Prov :—16.
Scotland :—Ben Brecht, Argyleshire. *Mr. Paterson.* (1874.)
"Spores .013 -.02 mm. long, and .008—.0095 mm. broad. Gelatina hymenea I intense-blue. Intermediate between *L. fecunda*, (T. M. Fr.)and *L. plicatilis*, Leight." (*Stirt.*)

355. *L. petræa*, (Wulf.), *griseo-pallescent or cinereo-fuscescent or albido-cinerascent, areolate* or granuloso-areolate, *areolæ contiguous* or dispersed, *convex or depressed*, hypothallus black, *(K brownish C pale-tawny); apothecia* black, small, *innato-sessile*, plane, marginate; hypothecium fuscous-black; spores 8, colourless or fuscous, ellipsoid or oblong, murali-locular.

On granitic and schistose rocks, frequent. 1811.

Syn :—Wulfen in Jacq. Coll. 3. 116. (1789.) Nyl. Scand. 233.
Fig :—E. Bot. 2336. Hepp Sporen t. 6. f. 36. 37. 38.
Exs :—Leight. 159. Mudd 195. Hepp 36. 37. 38. Zw. 132. T. M. Fries 45.
Geog. Distrib :—Switzerland, Germany, France, Hungary, Sweden.
Bot. Prov :—1, 2...5, 6, 7...10, 11...15, 16...18, 19...31.
England :—North of England. *Mr. Robertson.* (1811.) Sussex! Beechy Head! *Mr. Borrer.* Hampshire! *Mr. Lyell.* Lounsdale! Lanbraughrigg! Cliffrigg! Cleveland. *Mr. Mudd.* Craigforda! near Oswestry. *Rev. T. Salwey.* Northumberland and Durham. *Mr. Winch.* Sidmouth; Haldon, Devon. *Mr. Parfitt.* Lyndhurst Common; Highbeech; Epping Forest. *Rev. J. M. Crombie.* Bodbury Ring! near Church Stretton; Abdon Burf! Caer Caradoc! Bayston Hill! Lyth Hill! Haughmond Hill! Long Mynd! Laurence Hill! Shropshire; Wapley Hill! Herefordshire.

SCOTLAND :—Garrynahine, Lewis. *Dr. Lindsay.* Callander; Coast of Kincardine; near Aberdeen; Braemar; Blair Athole; Breadalbane; Appin, &c. *Rev. J. M. Crombie.*
IRELAND :—Glengariff! *Mr. Carroll.*
WALES :—Aberdovey! *Rev. A. Bloxam.* Barmouth! Moel-y-Golfa! Cader Idris! Pen-maen-mawr! Cwm Cywion! Glyn, Capel Curig! Drwsynant! Pass of Llanberis! Pen Cow! Goodwick Bay! Newport Road! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS:—Common on all the Islands. *Mr. Larbalestier.*

forma *albicans*, Fw. *whitish*, subtartareous, *effuse*, *areolate*, areolæ crowded, nearly or quite concealing the dark hypothallus.

On rocks, not common. 1854.

SYN :—Korb. Syst. 260. (1855.)
GEOG. DISTRIB :—Germany, Sweden.
BOT. PROV :—5...7...10.
ENGLAND :—Lanbraughrigg! Yorkshire. *Mr. Mudd.* (1854.) Llanymynech Hill! Shropshire.
WALES :—Criccieth! *Mr. Calcott.* Cader Idris!

forma *cinerea*, Fw. hypothallus black, dendritically effigurate, predominating; *areolæ cinerascent.*

On quartz, chert and hard rocks, frequent. 1800.

SYN :—Korb. Syst. p. 260. (1855.)
EXS :—Leight. 159. (in part).
GEOG. DISTRIB :—Germany.
BOT. PROV :—2...5, 6, 7...19.
ENGLAND :—Beechy Head! *Mr. Borrer.* (1800.) Caer Caradoc! Shropshire.
IRELAND :—Glengariff! *Mr. Carroll.*
WALES :—Drwsynant! Barmouth! Pen Cow! near Fishguard.

forma *fuscescens*, Leight. hypothallus black, predominating; *thallus contiguous or areolate, pale-brown.*

On hard rocks, common. 1800.

EXS :—Schær. 177. Zw. 133. Anzi Ven. 80. Mudd 195.
GEOG. DISTRIB :—Switzerland, Germany, Italy.
BOT. PROV :—2...5, 6, 7...10...20.
ENGLAND :—Beechy Head! *Mr. Borrer.* (1800.) Lanbraughrigg! Lounsdale! Yorkshire. *Mr. Mudd.* near Brighton! *Mr. Larbalestier.* Haughmond Hill! Caer Caradoc! *Mr. Phillips.*
IRELAND :—Cork! *Mr. Carroll.*
WALES :—Aberdovey! *Rev. A. Bloxam.* Goodwick Bay! Fishguard! Pembrokeshire. Cader Idris! Trefriw! Moel-y-gest!

forma *coracina*, Fw. *areolæ diffuse, nigrescent*, confused with the black predominating hypothallus.

On subalpine rocks, frequent.

SYN :—Korb. Syst. 260. (1855.)
EXS :—Fellm. 196.
GEOG. DISTRIB :—E. Lapland, Germany.
BOT. PROV :—2...5...7...10.
ENGLAND :—Beechy Head! *Mr. Borrer.* (1800.) Cliffrigg! Lounsdale! Yorkshire. *Mr. Mudd.* Abdon Burf! Bayston Hill! Lyth Hill! Laurence Hill! Haughmond Hill! Caradoc! Long Mynd! Sbropshire.
WALES :—Moel-y-Golfa!

forma *dispersa*, Leight. *areolæ pale or whitish-brown, more or less tumid and scattered* over the dark predominating hypothallus; apothecia sessile on or arising from the areolæ.

On hard rocks, not uncommon. 1800.

EXS:—Lindig. 159.
GEOG. DISTRIB :—Nova Granada.
BOT. PROV :—2...5...7...20.
ENGLAND :—Beechy Head! *Mr. Borrer.* (1800.) Craigforda! *Rev. T. Salwey.*
IRELAND :—Kilcully! Cork. *Mr. Carroll.*
WALES :—Drwsynant! Cwm Cywion! Moel-y-gest!

356. *L. geminata*, (Fw.) Th. Fr. *griseo-rufescent or albido-cinereous, areolate, areolæ more or less angular, plane or slightly tumid;* hypothallus black; *apothecia black, arising from the hypothallus, larger than the areolæ*, subsessile, plane, naked *with a thin persistent margin*, at length obliterated; hypothecium thick, nigro-fuscous; paraphyses slender, apices fuliginous; *spores* 1 *or* 2, at first colourless, then green, ultimately fusco-nigricant, *murali-locular.*

On alpine rocks, rare. (1871).

SYN :—Flot. in Korb. Syst. 259. (1855.) Nyl. Scand. 234. *Rhizocarpon*, Th. Fries L. Scand. 623. *Lecidea Montagnei*, Flot. in Korb. Syst. 258. Nyl. Scand. 235. Mudd Man. 219.
FIG :—Hepp Sporen t. 5. and 6. f. 28. and 37.
EXS :—Schær. 443. Hepp 28. 37. Zw. 201. Anzi Ital. S. 306.
GEOG. DISTRIB :—Sweden, Norway, Finland, Austria, Italy, Switzerland, Germany.
BOT. PROV :—7...15.
SCOTLAND :— Craig Guie, Braemar! *Rev. J. M. Crombie.*
WALES :—Cwm Ffynnon Llugwy! (1871.)
"Spores .040—57 mm. long, .025—32 mm. broad." *(Nyl.)* "Spores .040—72 mm. long, .025—34 mm. broad." (*Th. Fries.*) Spores .053 mm. long, .023 mm. broad.

357. *L. obscurata*, (Ach.) (Körb.) *pallido-fuscescent or rufo-fuscescent*, thin, subcontiguous, *minutely areolate*, areolæ nearly plane, (K pale-yellow C—); *apothecia* black, *moderate, plane, naked, innato-sessile or adnate, with an obtuse, thick, prominent, paler margin;* hypothecium thick, fuscous-black; spores 8, colourless, ellipsoid or ellipsoideo-oblong, murali-locular.

On subalpine rocks, frequent. 1866.

SYN :—*Rhizocarpon obscuratum*, Korb. Syst. 261. (1855.) T. M. Fries L. Scand. 628. *Lecidea obscurata*, Schær. Spicil. 130. *Lecidea concreta*, Leight. L. G. B. ed. 2. 351.
EXS :—Schær. 180. Hepp 756. Anzi Ital. S. 307. 309.
GEOG. DISTRIB :—Sweden, Norway, Finland, Italy, Austria, Switzerland.
BOT. PROV :—6, 7.
WALES :—Dolgelley! Moel-y-gest! *Mr. Calcott.* Cader Idris! (1866.) Glyn! near Capel Curig, between Fishguard and Llanachar! Pembrokeshire. Trefriw Falls!
"Spores .024—50 mm. long, .010—50 mm. broad. Gelatina hymenea I intense-blue. Paraphyses gelatinoso-conglutinate, apices subfuliginous or darkly fuscescent." (*T. M. Fries.*) Spores .033—.034 mm. long, .014—.015 mm. broad.

forma *ferrata*, Nyl. *ferruginous*; apothecia slightly *ferrugineo-suffused*, sometimes slightly umbilicate in the middle; spores 4—8, generally colourless, murali-locular.

On rocks. 1872.

SYN :—Nyl. Scand. 234. (1861.) Crombie in Journ. Bot. n. s. 2. 135.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie.* (1872.)
"Spores .032—48 mm. long, .015—18 mm. broad." *(Nyl.)*

358. *L. lavata*, Fr. *greyish-brown or dirty-subtestaceous, contiguous, smooth, slightly and coarsely rimulose; apothecia black*, or *blackish-brown, very large, elevato-adnate*, plane, roughish, and frequently umbonate, *with an excessively thick, obtuse, prominent, somewhat paler margin; hypothecium thick, black;* spores 8, colourless, oblong, or oblongo-ellipsoid, murali-locular.

On water-washed mountain rocks, frequent. 1814.

SYN :—*Lecidea atroalba var. lavata*, Fr. L. E. 313. *Rhizocarpon petræum var. lavatum*, Mudd Man. 220. Körb. S. L. 260. *Rh. obscuratum, f. lavata*, T. M. Fries L. Scand. 629. Obs. 2. *L. concreta, state*, Leight. L. G. B. 2d. ed. 351.

EXS :—Fr. L. S. 383. (teste Fr. l. c.)

GEOG. DISTRIB :—Sweden, Germany.

BOT. PROV :—5...7...10...15...20...26.

ENGLAND :—Teesdale; *Mr. Robertson.* (1814.) Wapley Hill! Herefordshire. Bodbury Ring! Long Mynd! near Church Stretton, Shropshire.

SCOTLAND :—Ben Nevis, Lochaber. *Rev. J. M. Crombie.*

IRELAND :—Musheragh Mount! Cork. *Mr. Carroll.* Kilmurry! Fermoy. *Mr. Chandler.* near Kylemore, Galway. *Mr. Larbalestier.*

WALES :—Llyn-y-Cae! Cader Idris, Pen-maen-mawr! Nant Gwynant! Snowdon.

Paraphyses indistinct. Gelatina hymenea I deep-blue or violet. Spores .031 mm. long, .016 mm. broad.

359. *L. concentrica*, (Dav.) *white or greyish-white*, very thin, *orbicular*, determinate, *tartareo-farinose*, continuous or rimulose, (K—C—); *apothecia concentrically arranged*, small, appressed or innate, black, plane or depressed, margin albo-suffused; hypothecium central, nigro-fuscous, small; spores 8, colourless, oblong, murali-locular.

On calcareous rocks, frequent. 1794.

SYN :—Davies in Trans. Linn. Soc. 2. 284. (1794.) *L. petræa*, Ach. Syn. 15. Nyl. Scand. 234.

FIG :—E. Bot. 246. Hepp Sporen t. 17. f. 149.

GEOG. DISTRIB :—Switzerland, Germany, Hungary, Italy, France, Sweden.

BOT. PROV :—1, 2, 3...5...7...10...14, 15, 16..19..31.

ENGLAND :—Sussex! *Mr. Borrer.* Kildale! Cleveland. *Mr. Mudd.* Malvern. *Dr. Holl.* Exeter. *Mr. Parfitt.* Plymouth. Brastead, Kent. *Mr. Holmes.* Whitecliff rocks! Ludlow, Shropshire.

SCOTLAND :—Pentland Hills; Blair Drummond; Appin; Dumblane, Forfarshire; Stonehaven. *Rev. J. M. Crombie.*

IRELAND :—Kilcully! Cork. *Mr. Carroll.*

WALES :—Whitford co. Flint. *Rev. Hugh Davies.* (1794.) Llangollen! Denbighshire; Crib Coch! Snowdon. Capel Curig!

CHANNEL ISLANDS :—Jersey; Guernsey. *Mr. Larbalestier.*

Different chemical reaction distinguishes this from *L. petræa*. Spores .032—.038 mm. long, .016—.019 mm. broad. Very variable, varying in the following forms :—

forma *typica*, white or dirty-greyish-whitish, thin, *orbicular*, contiguous and smooth, or very slightly rimulose, hypothallus black, (K—C—); *apothecia black, concentrically arranged, appressed or adnate*, plane or slightly concave, *with a thick tumid permanent prominent margin, slightly albo-suffused.*

On calcareous rocks, common.

FIG :—Hoffm. Pl. Lich. t. 50. f. 2. a. b. c.

EXS :—M. & N. 744. (in part.) Schær. 183. Hepp 149. Anzi It. 310 A.

GEOG. DISTRIB :—Scandinavia, Switzerland, Germany, Italy.

BOT. PROV :—5...7.

ENGLAND :—Whitecliff Rocks! Ludlow.

WALES :—Capel Curig! *Mr. Phillips.* Llangollen! Diganwy! near Conway.

forma *impressula*, Leight. *orbicular; apothecia concentrically arranged*, concave, *innate, almost urceolate, circumscissed*, with an *albo-suffused*, persistent, very prominent, *margin*.

On calcareous rocks, common.

Exs :—Reich. and Schub. 148. Leight. 17.
Geog. Distrib :—Germany, Hungary.
Bot. Prov :—2...5...7.
England :—Sussex ! *Mr. Borrer*. Whitecliff Rocks ! Ludlow.
Wales :—Llangollen !

forma *coarctata*, Leight. *diffuse, scattered*, or very slightly imperfectly orbicular; *apothecia scattered, innate, concave, circumscissed, with a thin, upturned, white, coarctate margin*.

On calcareous rocks, common.

Exs :—Anzi Ven. 81.
Geog. Distrib :—Italy.
Bot. Prov :—2...5, 6, 7...10...20...26.
England :—Sussex ! *Mr. Borrer*. Kildale ! Yorkshire. *Mr. Mudd*. Moor Park ! Herefordshire. Wrekin ! Shropshire.
Ireland :—Doughruagh Mountain ! Galway. *Mr. Larbalestier*. Kilcully ! Cork. *Mr. Carroll*.
Wales :—Builth ! Llyn Aran ! Cader Idris.

360. *L. excentrica*, Ach. *dirty-white or greyish-white*, thin, opake, *rimulose*, (K—C—); *apothecia* black, *sessile, plane, with a thickish obtuse naked margin*, scattered; spores colourless.

On calcareous rocks, not common. 1800.

Syn :—Ach. Meth. 37. (1803.) Nyl. Scand. 234.
Fig :—Hoffm. Pl. Lich. t. 50. f. 1.
Exs :—Arn. 684.
Geog. Distrib :—Sweden, Germany, Italy, Switzerland.
Bot. Prov :—2...6, 7...10...15, 16...19...26...30, 31.
England :—Sussex ! *Mr. Borrer*. (1800.) Carlton Bank ! Cleveland. *Mr. Mudd*.
Scotland :—Ben Lawers. *Dr. Holl*. Durris and Appin. *Rev. J. M. Crombie*.
Ireland :—Island Magee, Antrim. *Dr. Moore*. Killarney. *Adm. Jones*. Kylemore ! Doughruagh Mountain ! Salrock road ! Galway. *Mr. Larbalestier*.
Wales :—Conway; Crib Coch ! Drwsynant ! Pen Cow ! near Fishguard, Pembrokeshire; Llangollen ! *Mr. Calcott*.
Channel Islands :—St. Aubin's Fort ! Jersey. *Mr. Larbalestier*.

361. *L. rimosa*, (Dicks.) *white or bluish-white*, tartareous, *orbicular*, determinate, *anguloso-rimose in the centre, radiato-rimose towards the circumference*, which is appressed and minutely crenate, (K—C—); *apothecia* black, more or less *cæsio-pruinose*, rather large, plane, *innato-sessile, margin thick, albo-suffused*; hypothecium thickish, nigro-fuscous; *spores* 8, colourless, oblong, *muralilocular*.

On calcareous rocks, frequent. 1785.

Syn :—Dicks. Br. Crypt. 1. 12. (1785.) *L. calcarius*, Weis. Gott. 40. (1772). *L. umbilicata*, Ram. Act. Soc. Linn. Paris. 1827. p. 434. *L. petræa var. umbilicata*, Nyl. Prod. 128.
Fig :—E. Bot. 1736 ! Hepp Sporen t. 17. f. 147.
Exs :—Dicks. 24 ! ! ! Hepp 147. Arn. 215. Anzi Ital. S. 311. Mass. 15.
Geog. Distrib :—Switzerland, France, Pyrenees, Sweden, Hungary.
Bot. Prov :—5 . 7...10. 11. 12.. 15.
England :—Yorkshire ! *Mr. Dickson* (1785.) Heartside Fell between Penrith and Alston, Cumberland. *Rev. J. Holme*. Craig-y-Rhiw, Oswestry. *Rev. T. Salwey*. Bed of Wear ! Durham ! Banks of Tees near Middleton. *Mr. Robertson*. Carlton, Cleveland. *Mr. Mudd*. Brown Clee Hill ! Shropshire.

SCOTLAND :—Summit of Ben Lawers ! *Mr. Carroll.*
WALES :—Anglesea ! *Rev. Hugh Davies.* Eglwysyg Rocks ! Llangollen. Cefn Coch ! Snowdon.
The L. *colorata*, Wahl. would seem to be a composite species, and as Dickson's name has priority in time over Ramond's umbilicata, I have adopted it. Spores .02—.031 mm. long, .01—.011 mm. broad.

362. *L. plicatilis*, Leight. *dirty-white*, minutely plicato-verruco-granulose, areolato-diffract, (K yellow C yellow); hypothallus fuscous; *apothecia nigro-fuscous, large, closely adnate, connato-deformed, undulato-plicate*, margin obtuse, undulate, more or less attenuate or obliterated in age; hypothecium thick, nigro-fuscous; spores 4-8, colourless, elongato-ellipsoid, 3-4-5-septate, constricted, muralli-divided.

On alpine rocks, rare. 1869.

SYN :—Leight. in Ann. and Mag. N. H. Sept. 1869.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...15.
SCOTLAND :—Ben Lawers. *Dr. Stirton.*
WALES :—Llyn-y-Cae ! Cader Idris. (1869.) Moel-y-gest !
Spores .027 mm. long, .009 mm. broad.

363. *L. perluta*, Nyl. *albido-glaucescent or ochraceo-glaucescent*, thin, continuous, *rimose*, (K—C—); *apothecia ferrugineo-rufescent or ferrugineo-fuscescent*, plane, *with a paler margin*, internally subconcolorous; paraphyses slender, cohærent, apices luteo-rufescent; *hypothecium central, darkly-rufescent, with a lateral luteo-rufescent paler excipulum; spores* 8, *colourless, ellipsoideo-oblong, muraliform*, sometimes 3-septate, occasionally 1-septate and not muraliform.

On quartzose rocks. 1876.

SYN :—Nyl. in Flora 1876. p. 575.
BOT. PROV :—26.
IRELAND :—Kylemore Lake ! Banks of River Erriff ! Connemara. *Mr. Larbalestier.* (1876.)
"Spores .02—.042 mm. long, .013—16 mm. broad. Gelatina hymenea I blue then thece darkly-vinoso-fulvescent." *(Nyl.)* Spores .025—.0325 mm. long, .011—.012 mm. broad. Gelatina hymenea I deep-blue.

** *Hypothecium colourless.*

364. *L. fuscolutea*, (Dicks.) *white* or cream-coloured, *granuloso-verrucose*, effuse, (K yellow, apothecia crimson); *apothecia dull-yellow*, rather large, *elevato-sessile*, plane, *ochraceo-granuloso-pruinose, margin thick, inflexed*, paler, flexuose; hypothecium pale-yellow; spores 1, colourless, oblong or elliptico-oblong, *murali-reticulate.*

On mosses &c., in alpine districts, rare. 1782.

SYN :—Dicks. Br. Crypt. 2. 18. (1790.) Ach. Syn. 42. Mudd Man. 190.
FIG :—E. Bot. 1007. Dicks. l. c. t. 6. f. 2.
EXS :—Dicks. 25. Spruce Amaz. 180. Anzi Langob. 94.
GEOG. DISTRIB :—Lombardy, Amazons, Brazils, Mauritius, Scandinavia.
BOT. PROV :—11...19.
ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.* Cheviot and Hedgehope, Northumberland. *Mr. Winch.*
SCOTLAND :—Ben Lawers ! ! *Mr. Dickson.* Breadalbane. *Rev. Mr. Stuart.* (1782.) Ben Cruachan. *Rev. J. M. Crombie.*
"Spores (t. 3. f. 73.) .015 to .021 in. long, by .006 to .008 in. broad. Sper-

matia ellipsoid, excessively minute." (*Mudd.*) "Spores .048—100 mm. long, .024—55 mm. broad. Asci I dirty-blue then intensely-red or fulvescent." (*Th. M. Fries.*) Excipulum externally and apices of slender laxly cohærent paraphyses fulvescent. Spores .049 mm. long, .017 mm. broad.

365. *L. cupularis*, (Ehrh.) *whitish or cinerascent*, very thin, continuous ; *apothecia flesh-coloured* or yellowish-reddish, *superficial, prominent, concave, margin thickish, albescent*, entire or radiato-striate ; hypothecium colourless ; spores 8, colourless, ellipsoid, multiseptate, murali-locular.

On calcareous rocks, frequent. 1800.

SYN :—Ehrhart Beitr. 4. p. 45. (1789.) Ach. Syn. 46. Nyl. Scand. 189. Mudd Man. 166.

FIG :—E. Bot. 739. Leight. Ang. Lich. t. 13. f. 1.

EXS :—M. & N. 1153. Schær. 135. Rabh. 750. Anzi Etr. 22. Anzi It. S. 233. Mudd 139. Leight. 122. Hepp 142. Zw. 282. Rabh. 750.

GEOG. DISTRIB :—Switzerland, Germany, France, Italy, Bavaria, Pyrenees, Sweden, Austria, Hungary.

BOT. PROV :—1, 2, 3. 4, 5...7, 8...10...15, 16...19...27...31.

ENGLAND :—Corpusty Church. *Rev. Mr. Bryant.* (1800.) Norfolk. *Sir J. E. Smith.* Penzance. *Mr. Curnow.* Sussex Downs ! *Mr. Borrer.* Craig-y-Rhiw ! near Oswestry. *Rev. T. Salwey.* Calke Park ! Derbyshire. *Rev. A. Bloxam.* Broughton Park ! Bilsdale ! Cleveland. *Mr. Mudd.* on elm and ash, rare, Sussex ! *Mr. Borrer.* Fawdon Slate ; Bolyhope Bourn ; Middleton in Teesdale ! Durham. *Mr. Winch.* Midland Counties. *Mr. Purton.* North Leigh and Shotover Hill, Oxford. *Mr. Baxter.* Bisley Common ! Gloucestershire. *Mr. Joshua.* Aymestry ! Herefordshire. Whitecliff Rocks ! Ludlow ; High Rock ! Bridgnorth, Shropshire.

SCOTLAND :—Morrone ; Appin ; on moss, Ben Lawers and Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND :—Balaghbeama Gap, Kerry. *Mr. Carroll.* South of Ireland. *Miss Hutchins.* Killarney. *Dr. Carrington.* Ben Bulben, Sligo. *Prof. Dickie.* Glendalough ! and Twelve Pins Mountains ! Connemara. *Mr. Larbalestier.*

WALES :—Great Orme's Head ! Bryn Maelgwyn ! near Conway.

CHANNEL ISLANDS :—L'etacquerel ; Gorey Castle ; L'Etary ! Jersey ; Jerbourg, Guernsey. *Mr. Larbalestier.*

"Spores .004 to .0045 in. long, by .002 in. broad. Spermatia short, cylindrical, straight." (*Mudd.*) "Spores .015—16 mm. long, .008—9 mm. broad. Gelatina hymenea I blue then vinous-red." (*Nyl.*) "Spores .017—19 mm. long, .006 - 9 mm. broad. Paraphyses capillar, laxly cohærent." (*Th. M. Fries.*) Excipulum thickish, fleshy, colourless, enclosed laterally by a thalline receptacle. Spores .018—.022 mm. long, .008—.009. mm. broad.

366. *L. truncigena*, (Ach.) *cinerascent*, very thin, sub-leprose or evanescent ; *apothecia pale-reddish-flesh-coloured*, small, urceolate, margin albescent, thickish, entire ; hypothecium colourless ; *spores* 8, colourless, *oblongo-fusiform or oblong*, 5-7-*septate, irregularly longitudinally septate.*

On trees, elms, beech, frequent.

SYN :—Ach. L. U. 152. (1810.) Syn. 9. Nyl. Scand. 190. 191. Mudd Man. 167.

EXS :—Zw. 90. A. B. Leight. 147. Arn. 37.

GEOG. DISTRIB :—France, Germany, Switzerland, Sweden, Hungary.

BOT. PROV :—1, 2...5...10...19...24...31.

ENGLAND :—Ingleby ! Cleveland. *Mr. Mudd.* New Forest. *Rev. J. M. Crombie.* Castle Morton Common, Malvern. *Dr. Holl.* Tilgate Forest, Sussex. *Mr. Larbalestier.* Penzance. *Mr. Curnow.* near Cirencester. *Mr. Joshua.*

IRELAND :—Dunkerron ; Derriquin co. Kerry. *Dr. Taylor.* Curraghmore, Waterford. *Adm. Jones.* Castlemary and Kitaboro', Cork ; Adare ! ; Tervoe and Castleconnel, Limerick ; Dromoland, Clare ; Dinis Island, Killarney (on holly). *Mr. Carroll.*

CHANNEL ISLANDS :—St. John's Road, Jersey. *Mr. Larbalestier.*

"Spores .004 to .00475 in. long, by .0015 to .00175 in. broad." *(Mudd.)* "Spores .017—30 mm. long, .007—9 mm. broad." (*Nyl.*) Spores .019—.021 mm. long, .006—.007 mm. broad.

367. *L. Flotovii*, (Körb.) *cinerascent*, very thin, sub-leprose or evanescent; *apothecia pale-flesh-coloured*, small, urceolate, margin albescent, thick, entire; hypothecium colourless; *spores* 8, *colourless, ellipsoid, irregularly sub-murali-divided*, small.

On trees, elms, ash, rare. 1800.

SYN :—Nyl. Scand. 191. (1861.)
FIG :—Leight. Ang. Lich. t. 13. f. 3. Hepp Sporen t. 86. f. 749.
EXS :—Mudd 140. Hepp 749. Zw. 393. Arn. 94.
GEOG. DISTRIB :—France, Bavaria, Germany.
BOT. PROV—1, 2...5...10 24...26.
ENGLAND :—Sussex ! *Mr. Borrer.* (1800.) Bilsdale ! Ingleby ! Yorkshire. *Mr. Mudd.* Leigh Woods, Clifton ! *Mr. Larbalestier.* near Exeter. *Rev. J. M. Crombie.*
IRELAND :—Curraghmore. *Adm. Jones.* Castleconnel co. Limerick. *Mr. Carroll.*
"Spores .011—13 mm. long, .008—9 mm. broad." *(Nyl.)* Excipulum pale, fleshy, thin, subtended laterally by a thalline receptacle. Spores .013—.0145 mm. long, .008 mm. broad.

K. *Species polysporæ.*

368. *L. morio*, (Ram.) *yellowish-copper-coloured* or fusco-cinerascent, *areolate, areolæ plane*, somewhat shining, *angular*, radiato-plicate at the circumference, *(K yellow C red); hypothallus black; apothecia black, small, innate, plane*, often umbonate, margin thin, black, flexuose; hypothecium brown; spores innumerable, very minute, colourless, sphærical or shortly ellipsoid, simple.

On alpine rocks, rare.

SYN :—Ramond in DC. Fl. Franc. 2. 366. (1805.) Nyl. Scand. 290. Mudd Man. 192. (in part).
FIG :—Hepp Sporen t. 69. f. 603.
EXS :—Schær. 227. Anzi Langob. 164. Hepp 603. Nyl. Pyr. Or. 21. Arn. 604.
GEOG. DISTRIB :—Switzerland, Lombardy, Pyrenees, Norway, Finmark, Austria.
BOT. PROV :—7...10...15.
ENGLAND :—Thirsk, Yorkshire. *Mr. Baker.*
SCOTLAND :—Morrone, Braemar. *Rev. J. M. Crombie.*
WALES :—Near Dolgelley. *Dr. Holl.*
"Spores .00075 in. long, by .00025 to .0005 in. broad." (*Mudd.*) "Spores .0035—.005 mm. diam." (*Nyl.*) "Spores .003—4 mm. long, .002—3 mm. broad." *(Th. M. Fries.)*

369. *L. tantilla*, Nyl. *cinereo-virescent*, tartareous, *scurfy; apothecia fuscous or nigro-fuscous*, small, scattered, *sessile, convex, immarginate; hypothecium colourless;* spores innumerable, colourless, sphærical, simple.

On old palings, rare. 1865.

SYN :—Nyl. Prodr. 117. (1857.) *B. resinæ var. rubicundula*, Mudd Man. 191.
EXS :—Leight. inedit. 408. 441.
GEOG. DISTRIB :—France, Bavaria.
BOT. PROV :—3...5, 6...10.
ENGLAND :—Redcar, Yorkshire. *Mr. Mudd.* Hendon ! Middlesex, *Rev. J. M. Crombie.* near Worcester. *Dr. Holl.* Catalba Lodge, Reigate. *Mr. W. Joshua.* Moreton ! Oxfordshire. *Mr. Larbalestier.* Stableford ! near Bridgnorth, (1865.) Brace Meole ! Bomere Pool ! near Shrewsbury; Wilcot ! Sutton ! near Shrewsbury. Nobold ! Whitchurch ! Shropshire. Brampton Brian Park ! Herefordshire.

WALES :—Towyn ! Swansea !
Spores .004 mm. diam.

370. *L. resinæ*, Fr. *cinereo-virescent*, thin, effuse, *scurfy, or granulose ; apothecia pale-yellowish-brown*, small, numerous, *innato-sessile, convex, margin thin, pale ;* hypothecium pale ; spores innumerable, colourless, sphærical, simple.

On old trees, rare. 1854.

SYN :—Fries Syst. Mycol. 2. 149. (1822.) Nyl. Scand. 213. Mudd Man. 191. Grevillea 1. 58.
FIG :—Grevillea t. 4. f. 9. a. b. f. d. i. h.
EXS :—Leight. 277.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—7...10.
ENGLAND :—Cliffrigg ! Yorkshire. *Mr. Mudd.* (1854.)
WALES :—Dolgelley. *Mr. Holmes.* Gwydir Woods ! Bettws-y-coed. Glanartro ! near Llanbedr. Trefriw ! Wrekin !
Spores .0025—3 mm. diam. Paraphyses distinct, slender. Spermogonia tubercular, pale-yellowish-brown ; spermatia small, sphærical.

forma *cicatricicola*, Leight. *brownish, greenish-brown or purplish ; apothecia and spermogonia black* ; apothecia much more concave, sometimes substipitate ; epithecium dark, shining ; hypothecium nigro-fuscous ; spores slightly smaller.

On pine trees, rare. 1872.

SYN :—Leight. in Grevillea 1. 59.
FIG :—Grevillea l. c. t. 4. f. 9. c. g. e. k.
EXS :—Anzi Langob. 267. Rabh. 786.
GEOG. DISTRIB :—Sweden.
BOT. PROV :—7.
WALES :—Gwydir woods ! Bettws-y-coed. Glanartro ! near Llanbedr.

371. *L. ochrophora*, Nyl. obsolete ; apothecia *ochraceo-suffused, pulverulent*, small, convex or at length sub-globose, immarginate, dusky-pallescent within ; spores numerous, colourless, sphærical ; paraphyses slender or indistinct, a thin lamina of the apothecia entirely amber-colour ; gelatina hymenea cærulescent with iodine.

On trees in sub-alpine woods, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 355. Crombie En. 75.
GEOG. DISTRIB :—France.
BOT. PROV :—19...31.
IRELAND :—Dinis in Killarney. *Mr. Carroll.*
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .0035—45 mm. diam." *(Nyl.)*

372. *L. ascaridiella*, Nyl. *whitish*, thin, opake, *rimulose*, determinate ; apothecia *nigricant, innate*, most minute, *colourless within, margin* pseudo-thallodal, *crenulate ;* spores 16-32, colourless, *vermiform*, apically acute, once or twice torto-curvate, simple ; paraphyses very slender, large ; epithecium slightly fuscescent ; hypothecium colourless ; gelatina hymenea untinged with iodine.

On sandstone rocks in sub-alpine regions, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 163. Crombie En. 75.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Mangerton and adjacent Mountains in Kerry. *Mr. Carroll.*
"Belonging to the *Gyalecta*, near *L. leucaspis*, (Kphb.) Spores .025—.030 mm. long." *(Nyl.)*

373. *L. fossarum*, Duf. very thin, obscure or *evanescent ;*

*apothecia bright-croceo-rufous*, somewhat plane, appressed, immarginate, moderate; hypothecium colourless; thecæ polysporous; spores colourless, oblong or oblongo-cylindrical, simple.

On mossy rocks. 1868.

SYN :—Nyl. Prod. 116. (1857).
FIG :—DR. and Mont. Alger. t. 19. f. 4.
EXS :—Arn. 12. Zw. 367.
GEOG. DISTRIB :—France, Germany, Algeria.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers! *Messrs. Stirton and Galt.* (1868.)
"Spores .007—.011 mm. long, .003 mm. broad." (*Nyl.*) Spores .006—7 mm. long, .003 mm. broad.

374. *L. strepsodina*, Ach. *cinerascent or albo-cinerascent*, very thin, almost evanescent, smooth; *apothecia* black, crowded, *subrotundo-difformed*, oblong or subrotund, *rugose, margin plicate;* excipulum carbonaceous, hypothecium pale-nigro-fuscous; paraphyses distinct, cohærent, apices fuscous; spores innumerable, very minute.

On rocks, rare. 1866.

SYN :—Ach. L. U. 247. Syn. 71.
BOT. PROV :—1...7...26.
ENGLAND :—Penzance! *Rev. T. Salwey.*
IRELAND :—Glencorbot! *Mr. Larbalestier.* (1876.)
WALES :—Festiniog road, Dolgelley! (1866.)

L. *Parasitical Species.*

375. *L. vitellinaria*, Nyl. no proper thallus; apothecia parasitic, *black, very minute, scattered, sessile, concave, margin elevated, polished;* hypothecium brownish; *spores* 8, colourless, *elliptical or oblong, simple*, with 1 or 2 nuclei (in size and form exactly like those of *Lecidea parasema.*)

Parasitic on *Lecanora vitellina*, not common. 1851.

SYN :—Nyl. in Bot Not. 1852. p. 177. Scand. 218. Mudd Man. 212.
EXS :—Leight. 182. Arn. 193.
GEOG. DISTRIB :—Sweden, Austria, Germany.
BOT. PROV :—5...10...15.
ENGLAND :—Near Newton! Lanbraughrigg and Battersby, Yorkshire. *Mr. Mudd.* Black Mountain, Monmouthshire. *Dr. Holl.* Haughmond Hill! Long Mynd! Shropshire. (1851.)
SCOTLAND :—Breadalbane; Ben Lawers. *Rev. J. M. Crombie.*
"Spores .00175 to .002 in. long, by .001 in. broad." (*Mudd.*) "Spores .010—12 mm. long, .006 mm. broad." (*Nyl.*) Spores .011—.012 mm. long, .006 mm. broad.

376. *L. oxyspora*, (Tul.) no proper thallus; *apothecia* parasitic, *black or fuscous-black*, minute, *plane* or *sub-convex, immarginate;* hypothecium fuscescent; *spores* 8, *colourless, elliptical, simple*, with 2 nuclei.

Parasitic on various Parmeliei in sub-alpine regions, rare. 1856.

SYN :—Tul. Mem. 116. (1852.) Nyl. Scand. 246. Mudd Man. 225.
FIG :—Tul. l. c. t. 16. f. 27. Microscop. Journ. 5. t. 4. fig. 15. 16.
EXS :—Leight. 281.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—5...7...15...26.
ENGLAND :—Worcestershire Beacon! Malvern. *Mr. Lees.*
SCOTLAND :—Glen Shee! (1856.) Moncrieff Hill! Perth; Strathbran! Dunkeld; Corramulzie, Braemar. *Dr. Lindsay.*

IRELAND :—Ballynakill ! Letterfrack ! Galway. *Mr. Larbalestier.*
WALES :—Barmouth ! Cwm Idwall !
"Spores .00325 to .004 in. long, by .001 to .00125 broad." *(Mudd.)* "Spores .013—.019 mm. long, .045—.065 mm. broad." *(Tul.)* "Spores .014—20 mm. long, .005—7 mm. broad." *(Nyl.)* Spores .011 mm. long, .0025 mm. broad.

377. *L. leptostigma*, Nyl. parasitic on a whitish rimulose thallus, apothecia *fusco-nigricant*, plane, *innate*, *small*, *gregarious ; spores* 8, *colourless*, *globose*, or globoso-ellipsoid ; paraphyses moderate, thickened upwards and dirty-yellow at the apices ; hypothecium scarcely lutescent ; gelatina hymenea not tinged with iodine.

On micaceo-schistose rocks, rare. 1868.

SYN :—Nyl. in Flora 1868. p. 344. Crombie En. 76.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Rev. J. M. Crombie.*
"Spores .005—9 mm. diam." *(Nyl.)*

378. *L. imponens*, Leight. thallus obsolete ; *apothecia black*, minute, numerous, *scattered*, *sessile*, plane or subconcave, margin thin, eventually obliterated, *pale-bluish-cinerascent within ; hymenium and hypothecium hyaline*, *pale-bluish-cinerascent ; excipulum horny bluish-cinerascent*, *externally darker ;* paraphyses thick, cohærent, apices nigricant ; *spores* 8, *colourless*, *elliptical*, simple ; gelatina hymenea I dirty-fuscescent.

Parasitic on *Lecanora polytropa*, (Ehrh.) rare. 1876.

SYN :—Linn. Trans. 2d. ser. 1. 238. (1876.)
FIG :—Linn. Trans. l. c. t. 32. f. 7. 8.
BOT. PROV :—6.
WALES :—Fort Hill ! near Fishguard, Pembrokeshire. (1876.)
Spores .014—.015 mm. long, .0055 mm. broad.

379. *L. episema*, Nyl. no proper thallus ; *apothecia* parasitic, *black*, *aggregate*, *minute*, margin obtuse, entire ; hypothecium fuscous ; spores 8, colourless, ellipsoid or elongato-oblong, 1-septate ; paraphyses short and thick, with large globose fuliginous apices ; I lutescent.

Parasitic on *Lecanora calcarea*, not common. 1851.

SYN :—Nyl. Coll. Gall. m. Pyr. p. 12. (1853.) Prodr. 125.
GEOG. DISTRIB :—France, Italy, Pyrenees.
BOT. PROV :—1...7...19...26.
ENGLAND :—Near Yatton ! Somerset. *Mr. Joshua.*
IRELAND :—Kenmare Bay near Dunkerron. *Dr. Taylor.* Lough Corrib ! *Mr. Larbalestier.*
WALES :—Great Orme's Head ! (1851.)
"Spores .010—18 mm. long, .004—5 mm. broad." (*Nyl.*) Spores .013 mm. long, .005 mm. broad.

380. *L. cristata*, Leight. no proper thallus ; *apothecia* parasitic, *black*, very minute, *solitary* or more generally *clustered*, or in *narrow flexuose lines* like a hypothallus, concave, *margin thick and obtuse ; hypothecium black*, carbonaceous ; spores 8, colourless, lineari-oblong, faintly 1-septate, very minute.

Parasitic on the thallus of *Lecanora sub-carnea*, rare. 1856.

GEOG. DISTRIB :—Europe.
BOT. PROV :—7.

WALES:—Barmouth! (1856.)
Spores .0025—.003 mm. long, .002—.002 mm. broad.

381. *L. arenicola*, Nyl. thallus none; *apothecia parasitic on thallus of Baeomyces rufus and rosea*, minute, black, sessile, solitary, concave or plain, *margin* thick, obtuse, *slightly inflexed and polished*; hypothecium dark-brown; *spores* 4, colourless, slender, *clavato-cylindric, multiseptate*, cells containing oily globules.

Parasitic as above, rare. 1854.

SYN:—Nyl. in Bot. 1858. Mudd Man. 186. (1861.)
EXS:—Leight. 372.
GEOG. DISTRIB:—France.
BOT. PROV:—5, 7, 8, 10, 15, 26.
ENGLAND:—Guisborough Moor! Lotscribble; Ingleby Moor, Cleveland. *Mr. Mudd.* (1854.) Gelt Lane, Burton. *Dr. Hall.* Wagley Hill! Herefordshire; Shipentons! Shropshire.
SCOTLAND:—Ben Lawers. *Dr. Hall.*
IRELAND:—Near Kylemore! *Mr. Larbalestier.* (1877.)
WALES:—Cader Idris. *Dr. Hall.*
"Spores .014 to .018 in. long by .00075 in. broad." (*Mudd.*) Spores .075 mm. long, .004 mm. broad.

382. *L. Parmeliarum*, Smrf. thallus none; *apothecia parasitic, black or greenish, pruinose or naked, sub-innato-sessile, convex, ins-marginate*; hypothecium greenish-brown; *spores* 8, *fuscous, oblong, 1-septate.*

Parasitic on the thallus of various Parmeliei in sub-alpine regions, frequent.

SYN:—Smrf. Lapp. 176. (1826.) *Abrothallus Smithii & Welwitschii*, Tul. Mem. Lich. 113, 115. Mudd Man. 224.
FIG:—E. Bot. 1866. Microscop. Journ. 5. t. 4. fig. 1—14.
EXS:—Arn. 319. Anzi Langob. 230. Mudd 201. Zw. 321. Leight. 191. 309. 310.
GEOG. DISTRIB:—Germany, Lombardy, Lapland, Austria, Sweden, Italy.
BOT. PROV:—1, 5, 6, 7, 10, 13, 15, 19, 31.
ENGLAND:—Meadfoot! Torquay. *Dr. Deakin.* Ingleby Park! Cleveland. *Mr. Mudd.* Pembridge! Herefordshire. *Rev. J. F. Crouch*, Dartmoor; Malvern Hill; Meadfoot, Torquay, and near Bovey Tracy, S. Devon. *Dr. Hall.*
SCOTLAND:—Ben Nevis. *Messrs. Turner & Hooker.* Craigie Hill! Perth; Craig-y-Barnes; Strathbraan Road, Dunkeld; between Dumfries and Caerlaverock! *Dr. Lindsay.* Aberdeenshire! *Prof. Dickie.* Crianlarich. *Dr. Hall.* Countess Wells; Braemar; Craig Calliach; Trosachs. *Rev. J. M. Crombie.*
IRELAND:—Mangerton co. Kerry. *Dr. Taylor.*
WALES:—North Wales. *Mr. Griffith.* (1800.) Cribbath Hill near Ystrad Gynlais, S. Wales. *Mr. Sowerby.* Llyn Aran! Cader Idris; Moel-y-Golfa! Barmouth! between Bala and Dolgelley! near Capel Curig! Llyn Cwlyd! Eglwyseg rocks! Llyn Gerionydd! Pistyll Rhaiadr!
CHANNEL ISLANDS:—Jerbourg Cliffs! Guernsey. *Mr. Larbalestier.*
"Spores .003 to .0035 in. long, by .00125 in. broad." (*Mudd.*) "Spores .0128—.016 mm. long, .0065 broad." (*Tul.*)

383. *L. particularis*, Nyl. no proper thallus; *apothecia black, plane, marginate, internally sub-concolorous; hypothecium and excipulum nigricant; spores* 8, *fusco-nigrescent, ellipsoid*, 1-*septate*; paraphyses slender, not well distinct.

Parasitic on thallus of *Bæomyces rufus.* 1876.

SYN:—Nyl. in Flora 1877. p. 461.
BOT. PROV:—26.
IRELAND:—Near Kylemore, Galway. *Mr. Larbalestier.* (1876.)
"Thalamium in a thin section lutescent and with K somewhat purpurascent. Spores .008—.010 mm. long, .0035—.0045 mm. broad. Gelatina hymenea I intense-blue." (*Nyl.*)

384. *L. parasitica*, (Flk.) no proper thallus ; *apothecia* parasitic, *black, scattered or aggregate, concave or plane, sessile*, margin thin, elevated, entire, polished ; *hypothecium dark-reddish-brown ; spores* 8, *fuscous*, lineari-oblong, 3-*septate*, small.

Parasitic on the thallus of *Pertusaria communis and Lecanora parella*, frequent.

SYN :—Flörke D. L. 101. (1821.) Nyl. Prodr. 144. *Lecidea inspersa*, Tul. Mem. 118. Mudd Man. 224.
FIG :—Mudd Man. t. 4. f. 85.
EXS :—Leight. 183. Nyl. 68.
GEOG. DISTRIB :—France, Switzerland, New Zealand, Great Bear Lake.
BOT. PROV:—1, 2...5...7, 8...10...19...24...26...31.
ENGLAND :—Randiddles ! Hants. *Mr. Borrer.* Cliffrig ! Easeby Wood, Cleveland. *Mr. Mudd.* near Exeter, Devonshire. *Mr. Parfitt.* New Forest. *Rev. J. M. Crombie.* near Twycross, Leicestershire. *Rev. A. Bloxam.* Hale's End, Malvern ; S. Devon and Cornwall ; Fairlight near Hastings. *Dr. Holl.* Plymouth. *Mr. Holmes.* Wapley Hill ! Herefordshire.
IRELAND :—Blarney and Riverstown, Cork. *Mr. Carroll.* Curraghmore. *Adm. Jones.*
WALES :—Barmouth ! *Rev. T. Salwey.* Aber ! *Mr. W. Phillips.*
CHANNEL ISLANDS :—La Moye and St. Peter's Barracks ! Jersey. *Mr. Larbalestier.*
"Spores .013 mm. long, .0035 mm. broad." (*Tul.*) "Spores .009—.015 mm. long, .0035—.0045 mm. broad. Gelatina hymenea I intense-blue." (*Nyl.*) "Spores .003 in. long, by .001 in. broad." (*Mudd.*) Spores .01—.011 mm. long, .0035 mm. broad.

385. *L. parellaria*, Nyl. thallus none ; *apothecia black*, opake, small, *scattered, single or* 2 *or* 3 *together, sessile* in or near the cracks of the thallus, *plane, margin thickish, prominent, more or less pruinose ; hypothecium nigrofuscous*, thin ; paraphyses indistinct, conglutinate, apices clavate, nigricant ; *spores* 8, *fuscous, lineari-oblong, or oblong, generally* 1-*septate, sometimes* 2-*septate, and sometimes* 3-*septate in the same apothecium ;* gelatina hymenea I bluish then fuscescent.

Parasitic on *Lecanora parella*, (L.) not common. 1876.

SYN :—Nyl. in Flora 1876. p. 239. Leight. in Linn. Trans. 2d. ser. 1. 238.
FIG :—Linn. Trans. l. c. t. 32. f. 11. 12.
EXS :—Larb. 86.
GEOG. DISTRIB :—France, New Zealand.
BOT. PROV :—6, 7...26.
IRELAND :—Lough Feagh ! Doughruagh Mountains ! Connemara. *Mr. Larbalestier.* (1876.)
WALES :—Manoerowen ! Road between Fishguard and Llanachar ! Pembrokeshire. Diganwy near Conway !
Spores .011—.014 mm. long, .005 mm. broad.

386. *L. scapanaria*, Carringt. thallus none ; apothecia parasitic, *minute*, sparingly scattered, coarctate when young, explanate when mature or old, *dull-reddish-black*, plane, *margin* elevated, *somewhat tumid ; hypothecium thin, dark-yellowish-brown ;* spores 6-8, fuscous, obtusely fusiform, straight or slightly curved, 3-septate.

Parasitic on *Scapanaria undulata*, rare. 1861.

SYN :—Carrington Irish Crypt. 2. in Trans. Bot. Soc. Edin. 7. pt. 2. p. 382. and pt. 3. 411. (1861.) *L. persimilis*, Nyl. Scand. 236. Grevillea 2. 71.
FIG :—Trans. Bot. Soc. Edin. 7. t. 10. f. 4.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...26.
SCOTLAND :—Ben Lawers (1871.) Carlochan (1873.) *Dr. Stirton.*

IRELAND :—Cromaglown, Killarney. *Dr. Carrington.* (1861.) N. side of Doughruagh Mountain. *Mr. Larbalestier.*
"Spores .004—.005 in. long by .001 to .00125 in. broad." *(Mudd.)*

387. *L. Cladoniarum*, Nyl. thallus none; *apothecia black, minute, opake, slightly prominent, rugulose, internally dark or concolorous; spores* 8, *colourless,* (or sometimes normally fuscous) *oblong, simple;* hypothecium somewhat nigricant in the lower portion; paraphyses moderate.

Parasitic on *Cladonia uncialis and bellidiflora*, rare. 1861.

SYN :—Nyl. Enum. Sup. 339. (1857.) Crombie En. 94.
GEOG. DISTRIB :—Europe.
BOT. PROV :—23.
IRELAND :—Kelly's Glen near Dublin. *Dr. Moore.* (1861.)
"Spores .010 mm. long, .0035 mm. broad. Gelatina hymenea I blue then dirty." *(Nyl.)*

388. *L. advenula*, Leight. thallus obsolete; *apothecia nigro-fuscous,* minute, round, plane, or sub-convex, with a thin margin soon obliterated, *brownish within;* paraphyses indistinct, conglutinate, apices large, nigro-fuscous; *hypothecium thickish, nigro-fuscous; spores* 8, *nigro-fuscous, oblong,* 1-*septate.*

Parasitic on *Pertusaria sulphurea* (K y C orange-red.)

SYN :—Leight. in Linn. Trans. Bot. ser. 2. vol. 1. p. 146. (1876.)
FIG :—Linn. Trans. l. c. t. 22. f. 17. 18. 19. 20.
BOT. PROV :—7...26.
IRELAND :—Mweelan! Twelve Pins! Rocks base of Letter Hill! Connemara. *Mr. Larbalestier.*
WALES :—Llanbedrog! (Sept. 1874.)
Spores .024 mm. long, .013 mm. broad. Gelatina hymenea I—.

389. *L. epiphorbia*, Strn. "apothecia resemble, externally and internally, those of *L. Parmeliarum*, except that the paraphyses are neither thickened nor darker-coloured at their apices, the spores are colourless, or present, in a few instances, a faint tinge of yellow, and the reaction on the gelatina hymenea I deep vinous-red without any preceding cærulescent tint, instead of being negative, as in *L. Parmeliarum*. This lichen bears the same relationship to *L. Parmeliarum* that *L. Solorinaria* does to *L. oxyspora*." (Stirt.)

Parasitic on *Solorina limbata*. 1873.

SYN :—Stirton in Grevillea 2. p. 108.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Dr. Stirton.* (1873.)

390. *L. Walrothii*, (Tul.) thallus obsolete; *apothecia pale or denigrate,* plane or somewhat convex, small, *adnate;* hypothecium pale-dirty-tinge; paraphyses conglutinate, apices pale; *spores* 6-8, *colourless, ellipsoid, simple or* 1-*septate.*

Parasitic on *Solorina saccata* and *Peltigera canina*.

SYN :—*Scutula, Tul.* Mem. 119. (1852.) Nyl. Scand. 203.
FIG :—Tul. Mem. t. 14. f. 14—24.
EXS :—Schær. 630. Hepp 135. Nyl. 100.
GEOG. DISTRIB :—Switzerland, France.
BOT. PROV :—15.
SCOTLAND :—Glen Lyon, Perthshire! *Rev. J. M. Crombie.*
"Spores .009—.011 mm long, .0065 mm. broad." *(Tul.)* "Spores .007—.011 mm. long, .003—5 mm. broad. Gelatina hymenea I blue then vinous-red." *(Nyl.)* Spores .011—.012 mm. long, .005 mm. broad.

391. *L. persimilis*, Nyl. *whitish or whitish-grey*, thin, *minutely granuloso-areolate; apothecia black*, moderate, *appressed*, plane or slightly convex, naked, *slightly margined, internally nigricant, hypothecium fuscous-black;* hymenium cinerascent; *spores fusco nigrescent, oblongo-or fusiformi-ellipsoid*, 3-*septate.*

Parasitical on Jungermanniæ, rare.

SYN :—Nyl. in Sällsk. pro. F. et Fl. F. Not. n. s. 1. 237. Scand. 236.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers and Canlochan, Forfarshire. *Dr. Stirton.*
"Gelatina hymenea I intense-blue. Spores .019—23 mm. long, .008 mm. broad." (*Nyl.*)

392. *L. glaucomaria*, Nyl. thallus obsolete; merely a small irregular deformed pale nigro-fuscous patch or discoloration on which are the apothecia; *apothecia fusco-nigrous*, opake, clustered, *sub-innato-sessile, plane, margin thickish, paler, entire, often sub-flexuose;* hymenium fuscescent, paraphyses indistinct, cohærent, apices incrassate, fusco-nigricant; *hypothecium nigro-fuscous, thin; spores* 8, *colourless, oblongo-ovoid*, 3-*septate.*

Parasitic on *Lecanora glaucoma*, (Hoffm.) rare. 1876.

SYN :—Nyl. Obs. Holm. p. 177. (1852.) Scand. 245. Leight. in Linn. Trans. 2d. ser. 1. 239.
FIG :—Nyl. Obs. fig. 10. Linn. Trans. l. c. t. 32. f. 9. 10.
GEOG. DISTRIB :—Stockholm, France.
BOT. PROV :—6.
WALES :—Goodwick Bay! Pembrokeshire. (Sept. 1876.)
"Gelatina hymenea I pale-blue then vinous-red. Spores .021—.025 mm. long, .008—9 mm. broad." (*Nyl.*) The apothecia sometimes form warty agglomerations. Spores .0235 mm. long, .009 mm. broad. Not to be confounded with *Arthonia glaucomaria*, Nyl. (*A. varians*, Dav.) which grows on the apothecia (not on the thallus) of *L. glaucoma.*

393. *L. supernula*, Nyl. *apothecia black*, 3-6-*aggregate*, plane, slightly margined or at length convex immarginate, internally concolorous; paraphyses moderate or somewhat thick, apices clavate cærulescenti-nigricant; *hypothecium and excipulum cærulescenti-nigricant, rubricoso-rufescent above; spores* 8, *colourless, oblongo-ovoiform*, 1-*septate.*

Parasitic on *Lecanora calcarea f. Hoffmanni*, Ach.

SYN :—Nyl. in Flora 1876. p. 574.
BOT. PROV :—16.
SCOTLAND:—Island of Lismore. *Rev. J. M. Crombie.*
"Spores .009—.014 mm. long, .004—5 mm. broad. Gelatina hymenea I vinous-red." (*Nyl.*)

## II. ODONTOTREMA. *Nyl.*

Thallus indistinct. Apothecia black, thelotremoideo-lecideine or gymnotremoid, naked, at first closed, then dehiscing with denticulato-ruptured proper margin.

1. *O. longius*, Nyl. thallus whitish or albido-cinerascent, effuse; *apothecia black*, scattered, small, *rotundate or oblong, margin* thin, *flexuose* or unequal, *eventually obliterated;* hypothecium thin, nigro-fuscous; paraphyses distinct; spores 8, colourless, ellipsoideo-fusiform, obtuse at the apices, 3-septate.

On old rails, rare. 1867.

SYN :—Nyl. in litt. 1867. Crombie En. 95.
FIG :—Linn. Trans. ser. 2. 1. t. 32. f. 17.
EXS :—Leight. 409.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5...7.
ENGLAND :—Braydon Forest ! Wilts. *Mr. Joshua.* Brace Meole ! (1867.) Radbrook ! Haughmond Hill ! Shelton ! Wenlock ! Whitchurch ! Pulley ! near Shrewsbury, Shropshire.
WALES :—Towyn !
Spores .0195—.021 mm. long, .005—.007 mm. broad.

2. *O. majus*, Leight. whitish or evanescent ; *apothecia brownish, prominent, scattered, rotundate, suburceolate, margin thickish, prominent, persistent, nearly entire ;* hypothecium colourless or slightly fulvescent ; paraphyses distinct, slender ; *spores* 8, colourless, *broadly lineari-oblong,* 3-septate ; I renders the linear asci and spores lutescent.

On drift wood and decorticated willow stumps, rare. 1876.

SYN :—Leight. in Linn. Trans. 2d. ser. 1. 239.
FIG :—Linn. Trans. l. c. t. 32. f. 16.
GEOG. DISTRIB :—Great Slave Lake.
BOT. PROV :—5...6.
ENGLAND :—Hencote Pool ! near Shrewsbury. *Mr. W. Phillips.* (1876.) Oakley Park ! Cirencester. *Mr. Joshua.*
WALES :—Goodwick Bay ! Pembrokeshire.
Spores double the size of those of *O. minus,* Nyl. (.0115—.014 mm. long, .005 mm. broad. *Linn. Trans. 2d. ser.* 1. *t.* 32. *f.* 15), .019—.021 mm. long, .0075—.0085 mm. broad. Spermogonia brownish, oblong, minute ; spermatia oblong or lineari-oblong .0095 mm. long, .003 mm. broad.

### III. SCHIZOXYLON, *Pers.*

Thallus evanescent. Apothecia lecideine, elevated, naked, black. Spores numerous.

1. *Schizoxylon corticola,* (Frs.) Nyl. *whitish or yellowish-white,* thin, continuous, tartareous, smoothish ; *apothecia black,* very numerous, round, plano-convex, *sub-pulverulent or minutely granulose, immarginate ;* hypothecium thin, dark-brown ; paraphyses slender, distinct ; *spores innumerable,* colourless, very minute, oblong, simple.

On old oaks, rare. 1870.

SYN :—Nyl. Class. 2. p. 197. (1855.) Enum. gen. 127. Scand. 249 *Coniangium,* Fr. S. V. Sc. 121.
EXS :—Fr. 273. (fide Nyl).
GEOG. DISTRIB :—Europe.
BOT. PROV :—2.
ENGLAND :—Near Lyndhurst in New Forest ! *Rev. J. M. Crombie.*

## TRIBE XVI. GRAPHIDEI.

Thallus thin, scarcely visible or hypophlæodal. Apothecia lirelline.

### I. XYLOGRAPHA, *Fr. pr. p. Nyl.*

Apothecia linear, epithecium plane or concave or sulciform, longitudinally plicate. Spores colourless. Paraphyses distinct or indistinct, slender.

1. *X. parallela*, (Ach.) thallus an elongated whitish spot; *apothecia black, narrowly lanceolato-linear, erumpent, innate*, plane or somewhat concave, parallel, internally cinerascent; spores 8, colourless, ellipsoid, simple; paraphyses distinct, slender.

On old wooden posts, &c. rare.

SYN :—Nyl. Scand. 250. (1861.) Crombie En. 95. *Opegrapha parallela*, Ach. L. U. 253. (1810.)
EXS :—M. & N. 656. Fellm. 205. Körb. 257. Anzi Langob. 346. Arn. 244.
GEOG. DISTRIB :—Belgium, Switzerland, Bavaria, Austria, Hungary, Italy, E. Lapland.
BOT. PROV :—15.
SCOTLAND :—Glenfalloch! *Dr. Holl.* Pass of Killiecrankie; Glen Dee, Braemar. *Rev. J. M. Crombie.* Brechin! *Mr. Cooke.*
"Spores .011—16 mm. long, .005—7 mm. broad." (*Nyl.*) "Spores .011—17 mm. long, .005—7 mm. broad." (*T. M. Fr.*) Spores .012—.014 mm. long, .006 mm. broad.

var. *pallens*, Nyl. apothecia *pallescent.*

On old pales. 1872.

SYN :—Nyl. Scand. p. 250. Crombie in Journ. Bot. n. s. 2. 135.
GEOG. DISTRIB :—Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. Pass of Killiecrankie, Blair Athole. *Rev. J. M. Crombie.* (1872.)

f. *elliptica*, Nyl. apothecia *shorter, oblong*, or difformed.

SYN :—Nyl. in litt. Crombie l. c.
BOT. PROV :—15.
SCOTLAND :—Pass of Killiecrankie, Blair Athole. *Rev. J. M. Crombie.* (1872.

2. *A. laricicola*, Nyl. *greyish-white*, very thin, effuse, or evanescent; *apothecia black, minute, superficial, oblong or slightly flexuose*, irregularly scattered, at length somewhat explanate, with an evanescent margin, internally whitish; hypothecium brown; spores 8, colourless, ellipsoid, simple; paraphyses none; gelatina hymenea I tawny vinous-red.

On larch trees near the base, rare. 1874.

SYN :—Nyl. in Flora 1875. p. 13.
EXS :—Crombie 97.
BOT. PROV :—15.
SCOTLAND :—On a single tree in Lawers' Glen! Ben Lawers. *Rev. J. M. Crombie.* (1874.)
"Spores .0012—15 mm. long, .007—8 mm. broad." (*Nyl.*) Spores .013 mm. long,. 006 mm. broad.

3. *X. scaphoidea*, Strn. *albo-macular* or obsolete; apothecia *fuscous*, prominent, *oblong, roundish*, or even flexuose, *small;* epithecium rimæform, margin prominent, rounded; *hypothecium colourless;* spores 8, colourless, ellipsoid, simple, moderate; paraphyses indistinct; gelatina hymenea I obsoletely cærulescent, then fulvescent; gonidia large, green, interspersed amongst the fibres of the wood.

On decorticated alder. 1874.

SYN :—Stirton in Grevillea 3. p. 35. (1874.)
BOT. PROV :—15.
SCOTLAND :—Near Dalwhinnie and Grantown. *Dr. Stirton.* (1874.)
"Spores .012—.016 mm. long, .006—.008 mm. broad." (*Stirt.*)

4. *X. flexella*, (Ach.) *whitish; apothecia black*, minute, *superficial*, oblong; epithecium rimæform or irregularly dilated; *hypothecium fuscescent;* spores 8, colourless, globoso-ellipsoid, ovoid or ellipsoid, simple, *most minute.*

On decorticated stumps, not common. 1875.

SYN :—*Limboria*, Ach. Vet. Ak. Handl. 1815, p. 258. and 1817. p. 222. *Xylographa*, Nyl. Scand. 250.
EXS :—Arn. 525. M. & N. 1094.
GEOG. DISTRIB :—Switzerland, Germany, Sweden, Norway, Lapland, Arctic America.
BOT. PROV :—5.
ENGLAND :—Oakley Park, near Cirencester! *Mr Joshua.* (1875.)
"Spores .004—5 mm. long, .002—3 mm. broad." (*Nyl.*) "Spores .004—6 mm. long, .002—3 mm. broad." (*T. M. Fr.*) Spores .004 mm. long, .002 mm. broad.

## II. PTYCHOGRAPHA, *Nyl.*

Thallus effuse, macular. Apothecia prominent, parallel, with 2 or 4 longitudinal hymenia in each. Spores 8, colourless, simple. Gelatina hymenea I vinose-red.

1. *P. xylographoides*, Nyl. *greyish-white*, macular, or nearly obsolete, internally with the gonidia sub-glomerated; apothecia *black*, *lanceolate*, somewhat prominent, above plane; *epithecium* usually *longitudinally* 1-*or* 3-*plicated*, margined, within concolorous; spores 8, colourless, ellipsoid, simple; epithecium nearly colourless; *hypothecium* and *perithecium black;* gelatina hymenea I vinous-red.

On decorticated mountain-ash. 1874,

SYN :—Nyl. in. Flora 1874. p. 315. Crombie in Journ. Bot. n. s. 3. 257.
FIG :—Journ. Bot. l. c. t. 150.
BOT. PROV: —15.
SCOTLAND :—Craig Calliach, Killin. *Rev. J. M. Crombie.* (1874.)
"Spores .011—14 mm. long, .006—7 mm. broad." (*Crombie.*)

## III. AGYRIUM. *Fr.* in part, *Nyl.*

Thallus scarcely visible. Apothecia oblong or rotundate, epithecium plane or convex. Paraphyses distinct.

1. *A. rufum*, (Pers.) thallus indicated by a whitish spot; *apothecia bright-red*, rotundate or oblong, pale or convex, prominent, *sub-tuberculose;* hypothecium pale; spores 8, colourless or rufescent, ellipsoid, simple.

On old posts, &c., rare.

SYN :—*Stictis rufa*, Pers. Obs. Myc. 2. p. 74. (1799.) *Agyrium*, Fr. S. M. 2. 232. Nyl. Scand. 250.
FIG :—Pers. Obs. Myc. t. 6. f. 6.
EXS :—Fellm. 206. M. & N. 1096.
GEOG. DISTRIB :—Scandinavia, Switzerland, France.
BOT. PROV :—6, 7...15...19.
SCOTLAND :—Achrosagan, Appin. *Rev. J. M. Crombie.*
IRELAND :—Crogham! Killarney. *Messrs. Wright & Carroll.* Dinis, Killarney. *Mr. Carroll.*
WALES :—Gaer Ditches! near Knighton, Radnorshire, Dolgelley!
"Spores .011—14 mm. long, .007—9 mm. broad." (*Nyl.*) Spores .012 mm. long, .008 mm. broad.

## IV. LITHOGRAPHA, *Nyl.*

Thallus crustaceous or evanescent; apothecia lirellæform, black, tumid, epithecium rimiform, margins thick, convex; hypothecium black, thick, entire; spores 8 or numerous, simple or 1-septate.

1. *L. tesserata*, (DC.) *pale-brownish-grey*, crustaceous, *tessellato-areolate*, areolæ plano-convex, (K yellow then red); *apothecia fuscous-black*, lirellæform, slightly prominent, short, obtuse, simple or slightly divided, *solitary or clustered*, straight or curved; *epithecium rimæform*, *margin thick*, *inflexed*; hypothecium thick, black; spores 8, colourless, oblong or ellipsoid, simple, minute.

On alpine rocks, rare.

Syn :—*Opegrapha tesselata*, DC. Fl. Fr. 2. 313. (1805.) Leight. Br. Graphid. p. 8. *Opegrapha petræa*, Ach. Syn. 72. *Lithographa tesserata*, Nyl. Scand. 290. Mudd Man. 225.
Fig :—E. Bot. Suppl. 2632. fig. 2. Leight. Br. Graph. t. 5. f. 1.
Exs :—Leight. 396. Anzi Langob. 203. Th. M. Fries 46. Körb. 256.
Geog. Distrib :—Sweden, Italy.
Bot. Prov :—1...7...10, 11, 12...15.
England :—Holwick Scar, on the Tees, Yorkshire. *Mr. Robertson.* Valley of Rocks, Linton, N. Devon. *Mr. Borrer.* Middleton in Teesdale, Durham. *Rev. J. Harriman.* near Staveley. *Mr. Martindale.*
Scotland :—Morrone; Ben Lawers; Cairn Gowar. *Rev. J. M. Crombie.*
Wales :—Snowdon. *Mr. Holmes.* Cader Idris, north west side! Llyn Aran! Llyn-y-Cae! Cader Idris; Aran Mowddy! Cwm Cywion! Glyder Vach! Pass of Llanberis! Cwm Cwlyd! Cwm Clyd! Moel-y-gest! near Tremadoc.
"Spores .002 in. long, by .001 in. broad, t. 4. f. 87." (*Mudd.*) "Spores .008—.011 mm. long, .0045—.0065 mm. broad." (*Nyl.*) "Spores .010—15 mm. long, .005—8 mm. broad." (*T. M. Fr.*) Spores .011 mm. long, .005 mm. broad.

2. *L. petræa*, (Durieu.) *evanescent; apothecia black*, lirellæform, thick, *linear*, *simple*, somewhat shining, *clustered and congregated*, flexuose; epithecium rimæform; *margin very thick*, *tumid*, *inflexed*; hypothecium thick, black; spores numerous, colourless, oblongo-cylindrical, simple.

On rocks, rare.

Syn :—Mont. & Dur. Expl. Sc. Alger. 278. (1846.) Nyl. Prodr. 147.
Exs :—Larbal. 40.
Geog. Distrib :—Algeria.
Bot. Prov :—26...31.
Ireland :—Lettermore and near Kylemore! *Mr. Larbalestier.*
Channel Islands :—Le Fret Common! Noirmont! Jersey. *Mr. Larbalestier.*
"Spores .003—4 mm. long, .001 mm. broad." (*Nyl.*)

3. *L. dendrographa*, Nyl. cinerascent, effuse or *evanescent*, (K—C—); *apothecia black*, *linear or oblong or elliptical*, *simple or slightly furcato-divided*, *erumpent*; *epithecium* black, opake, narrow, at length *applanate*, *margin prominent*, thin, *shining*, more or less flexuose; hypothecium fuscous-black; spores numerous, colourless, ellipsoid, minute, simple; paraphyses indistinct.

On trees, rare. 1869.

Syn :—Nyl. in Flora 1864. p. 488. Crombie Enum. 95.
Geog. Distrib :—France.
Bot. Prov :—1, 2...31.
England :—Near Totnes, S. Devon. *Dr. Holl.* (1869.) Budleigh Salterton. *Prof. Dickie.* River Dart! Cornwall. *Mr. Curnow.* Stoney Cross, New Forest. Whitefield, Isle of Wight. *Mr. Holmes.*

"Spores .005—8 mm. long, .0083—4 mm. broad." (*Nyl.*) Spores .0085 mm. long, .004 mm. broad.

4. *L. Larbalestierii*, Leight. *pallido-stramineous, minutely and irregularly granulate, slightly pulverulent*, thin, effuse, indeterminate, (K yellow C—); *apothecia black, slightly shining, very numerous and minute, rounded, variously angular or sublirellæform* by compression, *stipitate, coacervate and aggregate and difformed, in irregular scattered very prominent groups or clusters* about the size of mustard-seed; *epithecium plane or often compressed and opegraphine or rimæform*, with an elevated thickish incurved margin; *hypothecium pale-brownish, somewhat nigricant;* hymenium dusky, paraphyses distinct, slender, apices colourless; spores 8, colourless, oblong or ellipsoid, simple.

On quartzose rocks, very rare. 1877.

Bot. Prov:—26.
Ireland:—Banks of Kylemore Lake! co. Galway. *Mr. Larbalestier.* (1877.)
Spores .016—.017 mm. long, .008—.009 mm. broad. Iodine tinges thecæ blue then fulvescent. A most remarkable and striking lichen.

5. *L. Andrewii*, Stirt. *white or whitish* or when rubbed cinerascent, (K—C—) thickish; *apothecia black*, small, *at first albovelate*, at length *erumpent*, crowded, *sessile or innato-sessile*, rotundate, oblong, simple or rarely divided; *epithecium rimæform*, at length *explanate*, fulvescent; proper margin prominent, generally inflexed; paraphyses distinct, colourless at the apices; hypothecium colourless; *spores* 8, colourless, *simple*, shortly ellipsoid or often globose, nucleolate.

On granite rocks, rare. 1878.

Syn:—Stirton in Scottish Naturalist July 1878. p. 300.
Bot. Prov:—13.
Scotland:—New Galloway. *Mr. J. M'Andrew.* (1878.)
"Spores .0065—.011 mm. long, .005—.007 mm. broad. Gelatina hymenea I—." (*Stirt.*)

6. *L. cerebrina*, Schær. *chalky-white*, tartareous, contiguous, (K—C—); *apothecia* scattered or congregate, sessile, *variously plicato-deformed, black;* hypothecium black, thick; spores 8, fuliginous or nigricant, lineari-oblong, 1-septate.

On calcareous rocks, rare.

Syn:—Schær. Spic. 136, 196. (1823–1836.) Nyl. Prodr. 140, *Opegrapha*, DC. Leight. Br. Graph. 8. Mudd Man. 226.
Fig:—E. Bot. Suppl. 2632. fig. 1. (1830.) Leight. Br. Graph. t. 5. f. 2.
Exs:—Arn. 133. Anzi Langob. 202.
Geog. Distrib:—Bavaria, Italy, Pyrenees, France.
Bot. Prov:—1...8...10, 11, 12.
England:—Northern Counties. *Mr. Dickson.* Teesdale! Durham. *Rev. J. Harriman.* Ingleborough. *Dr. Carrington.* Penhill. *Mr. Baker.* Matlock co. Derby. *Dr. Holl.* Dartmouth. *Mr. Parfitt.*
"Spores .0035 to .004 in. long, by .00125 to .0015 in. broad, t. 4. f. 88." (*Mudd.*) "Spores .015—21 mm. long, .008—.011 mm. broad." (*Nyl.*) Spores .023 mm. long, .012 mm. broad.

7. *L. interjecta*, Leight. *albido-subvirescent*, tartareous, thin, *furfuraceous*, almost evanescent; *apothecia black*, lirellæform, *somewhat shining, linear*, simple or sometimes branched, solitary or

clustered, *flexuose; epithecium very narrow, rimæform;* margin tumid, inflexed; hypothecium black; spores 8, colourless, oblong, 1-septate.

On slaty maritime rocks, very rare. 1856.

BOT. PROV:—7.
WALES:—Barmouth! (1856.) Cwm Cywion!
Spores .021—.023 mm. long, .009 mm. broad.

## V. OPEGRAPHA, *Ach. Nyl.*

Thallus very thin or scarcely any. Apothecia (lirellæ) black, superficial, lineari-lanceolate or sub-rotundate or linear, elongate or flexuose or ramoso-divided, with a proper margin; perithecium entire; epithecium plane or rimæformi-angustate; spores 8, colourless or fuscescent, lineari-oblong, sub-clavato-fusiform, fusiform or acicular, 1-multi-septate.

* *Spores* 1-*septate.*

1. *O. lentiginosa*, Lyell. *cream-coloured*, thin, tartareous, smooth, nigro-fusco-limitate; *lirellæ excessively prominent and sessile, very minute, punctiform, oblong or linear*, straight, simple; *perithecium entire;* epithecium rimæform; proper margin tumid and incurved; *spores* 8, *fuscescent, irregularly obovate*, 1-*septate*, constricted.

On beech and holly and oak, rare.

SYN:—Leight. Br. Graph. 26. (1854.) Nyl. Prod. 158. Mudd Man. 226.
FIG:—Leight. Br. Graph. t. 6. f. 16.
EXS:—Crombie 98.
GEOG. DISTRIB:—France, Normandy.
BOT. PROV:—1, 2...19.
ENGLAND:—New Forest! Hants. *Mr. Lyell in herb. Borrer.* St. Leonard's Forest! Sussex. *Mr. Borrer.* near Lyndhurst, New Forest. *Rev. J. M. Crombie.* Tilgate Forest, Sussex. *Mr. Larbalestier.* Ivybridge. *Mr. Holmes.*
IRELAND:—Curraghmore. *Adm. Jones.* Old Deer Park, Castlemartyr, Cork; Glenbower, Killeagh. *Mr. Carroll.*
"Spores .0025 to .003 in. long, by .001 to .00125 in. broad, t. 4. f. 89." (*Mudd.*) "Spores .011—16 mm. long, .006—7 mm. broad." (*Nyl.*) Spores .015—.016 mm. long, .006—7 mm. broad.

2. *O. lentiginosula*, Nyl. *thallus evanescent; lirellæ excessively prominent and sessile, very minute, ellipsoid*, straight, simple, rarely divided; *perithecium colourless* or deficient at the base; epithecium rimæform; proper margin tumid and incurved; *spores* 8, *fuscous, obovate*, 1-*septate*, constricted, larger than in *lentiginosa;* paraphyses indistinct.

On pines in sub-alpine regions, rare. 1864.

SYN:—Nyl. in Flora 1865. p. 355.
GEOG. DISTRIB:—Europe.
BOT. PROV:—15.
SCOTLAND:—Glenfalloch! *Mr. Carroll.* (1864.)
"Spores .020—23 mm. long, .010—11 mm. broad." (*Nyl.*)

3. *O. diplasiospora*, Nyl. *albido-glaucescent, thin, smooth*, membranaceous, effuse; *lirellæ oblong or lanceolato-oblong*, small, innato-erumpent, black; epithecium expanded, plane; proper margin thin, elevated, inflexed; perithecium nigro-fuscous, entire at the base; paraphyses none; spores 8, fusco-nigrescent, obovate, 1-septate, constricted, double the size of those of *O. lentiginosa.*

On holly in mountain ranges, rare. 1867.

SYN :—Nyl. N. Granada ed. 1. 62. (1863.) ed. 2. 92.
FIG :—Nyl. N. Gran. ed. 1. t. 2. f. 41.
EXS :—Lindig 2787. & 846.
GEOG. DISTRIB :—N. Granada, Europe.
BOT. PROV :—19.
IRELAND :—Turk [Mountain ! Cromaglown, Killarney. *Mr. Carroll.* (1867.)
"Spores .027—32 mm. long, .012—16 mm. broad." (*Nyl.*) Spores .026—.029 mm. long, .009—.010 mm. broad.

4. *O. constrictella*, Stirtn. *whitish* or palish, thin ; *apothecia internally pallido-fuscescent, black*, simple, sometimes *aggregate* ; epithecium broad, concave, or also explanate ; *perithecium lateral* ; *paraphyses crowded*, irregular, not well distinct, apices fuscous (K dirty-blue) ; *hypothecium colourless* ; spores 8, *colourless*, obovate, 1-septate, constricted.

On old bark. 1874.

SYN :—Stirton in Scott. Naturalist 4. p. 29. (1877.)
BOT. PROV :—16.
SCOTLAND :—Ben Brecht, Argyleshire. *Mr. Paterson.* (1874.)
Spores .012—.017 mm. long, .0045—.0065 mm. broad. Gelatina hymenea I—.

** *Spores 3-septate.*

5. *O. herpetica*, Ach. *dusky-olive*, thin, sub-tartareous, more or less cracked or slightly rugged, fusco-limitate, (K reddish) ; *lirellæ* small, *innate*, round, oval, oblong or lineari-oblong, obtuse, simple and divided, straight or curved ; disk rimæform, expanded in age ; proper margin thick, rounded and inflexed ; spores 8, colourless, fusiform, 3-septate.

On trees, oak, ash, beech, frequent.

forma *vera*, Leight. thallus tuberculate, pulverulent ; lirellæ imbedded, small, simple, naked.

SYN :—Leight. Br. Graph. 19. (1854.) Ach. Syn. 72. Nyl. Scand. 255. Mudd Man. 234.
FIG :—E. Bot. 1789. Leight. Br. Graph. t. 5. f. 12.
EXS :—Nyl. 81. Mudd 213. Hepp 555.
GEOG. DISTRIB :—Europe, France, Switzerland, Sweden, N. America.
BOT. PROV :—1...3, 4, 5...8...11...15...19...28...31.
ENGLAND :—Bradwell ! Suffolk. *Mr. Borrer.* Twycross ! Charnwood Forest ! Leicestershire. *Rev. A. Bloxam.* Epping Eorest and Exeter. *Rev. J. M. Crombie.* Oxfordshire ! *Mr. Baxter.* Chelmsford ! Essex. *Mr. Piggott.* near Newcastle, Northumberland. *Mr. Winch.* Haldon Wood, Exeter. *Mr. Parfitt.* Ivybridge. *Mr. Davies.* Shere ! *Dr. Capron.* Wye, Brastead, Kent. *Mr. Holmes.* Haughmond Hill ! Weir Coppice near Shrewsbury !
SCOTLAND :—Lasswade ! and near Dundee ! *Dr. Greville.* near Stirling. *Rev. J. M. Crombie.*
IRELAND :—Armagh. *Adm. Jones.* Turk Mountain and McCarthy's Island, Killarney. *Mr. Carroll.*
CHANNEL ISLANDS :—St. Peter's Valley ! Jersey. *Mr. Larbalestier.*
"Spores .0035 to .004 in. long, by .00075 in. broad." *Mudd.)* "Spores .016—23 mm. long, .0045 mm. broad." (*Nyl.*) Spores .018—.024 mm. long, .004 mm. broad.

forma *sub-ocellata*, Ach. thallus tuberculate, pulverulent, (K reddish) ; *lirellæ* imbedded, small, simple or sub-stellate, *albo-ocellate*.

On trees, frequent.

SYN :—Leight. Br. Graph. 21. Mudd Man. 234.
FIG :—Chevall. Hist. Graph. t. 19. f. 4. & f. 3.

EXS :—Hepp 556. Leight. 222. M. & N. 555. Schær. 281. Nyl. 82. Anzi 338. Zw. 355. Rabh. 781.
GEOG. DISTRIB :—Switzerland, Italy, Germany, France, Sweden.
BOT. PROV :—2, 3...7...10...31.
ENGLAND :—Hurst ! Cuckfield ! and Ardingley ! Sussex. *Mr. Borrer.* Bovingar ! Essex. *Mr. Lyell.* near Thirsk ! Yorkshire. *Mr. Baker.* Cliffrigg ! Airyholme Wood ! Kildale ! Easby Wood ! Yorkshire. *Mr. Mudd.*
WALES :—Edderton Wood ! Montgomeryshire.
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

forma *elegans*, Borr. thallus pulverulent, (K reddish) ; lirellæ larger, simple and divided, prominent, wavy.

On trees, rare.

SYN :—Leight. Br. Graph. 21. (1854.) Mudd Man. 235.
EXS :—Leight. 286.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...10...15.
ENGLAND :—Ardingley ! Sussex. *Mr. Borrer.* Easby Wood ! Ingleby ! Yorkshire. *Mr. Mudd.* Epping Forest and Exeter. *Rev. J. M. Crombie.*
SCOTLAND :—Near Stirling. *Rev. J. M. Crombie.*

forma *rubella*, Pers. thallus smooth, (K reddish) ; lirellæ prominent, simple, immersed only at the base.

On trees, birch, common.

SYN :—Pers. Ust. Ann. Bot. st. 7. t. 1. f. 2. A. a. (1794.) Leight. Br. Graph. p. 22. Mudd Man. 235. *Opeg. herpetica var. disparata.* Ach. Syn. 73. Nyl. Scand. 255.
FIG :—Cheval. Hist. Graphid. t. 17. f. 1. a. f. 2.
EXS :—Schær. 95. Leight. 221. Anzi 339. Bohl. 74. Hepp 557.
GEOG. DISTRIB :—Switzerland, Italy, Pyrenees, France, Germany, Sweden.
BOT. PROV :—2...3...5...7...10...31.
ENGLAND :—St. Leonard's Forest ! and Charlton Forest ! Sussex. *Mr. Borrer.* Berrow, S. end of Malvern Hills ! Worcestershire. *Mr. Lees.* Yorkshire. *Mr. Dixon.* Airyholme Wood ! Cliffrigg ! Cleveland. *Mr. Mudd.* Stoke Wood, Exeter. *Mr. Parfitt.* Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Tetsworth ! Oxfordshire. *Mr. Larbalestier.*
WALES :—Llanbedrog !
CHANNEL ISLANDS ;—Grouville, Jersey. *Mr. Larbalestier.*

forma *rufescens*, Pers. dark-dingy-olive, (K reddish) ; *lirellæ* prominent, immersed only at the base, *flexuose, sub-stellato-ramose ;* epithecium plane, more or less canaliculate.

On ash, birch, and holly trees, not common.

SYN :—*O. rufescens*, Pers. Ust. Ann. Bot. st. 7. p. 29. t. 2. f. 3. A. a. (1794.) Nyl. Scand. 256. Mudd Man. 235. *O. siderella*, Ach. Syn. 79. *O. herpetica var. rubella f. divisa*, Leight. Br. Graph. 22.
FIG :—Cheval. Hist. Graph. t. 18. f. 1. a. f. 26. f. 3. c.
EXS :—Mudd 214.
GEOG. DISTRIB :—Normandy, Italy, Sweden, Belgium.
BOT. PROV :—2, 3...5...7, 8...10.
ENGLAND:—Sussex ! *Mr. Borrer.* Gopsall Wood ! Leicestershire. *Rev. A. Bloxam.* near Ayton ! Cleveland. *Mr. Mudd.* Stoke Wood, Exeter. *Mr. Parfitt.* Weir Coppice ! near Shrewsbury.
WALES :—Trefriw !
Nylander in Flora 1873. p. 299. says that *rufescens* differs specifically from *herpetica* according to the spermogonia.

forma *arthonoidea*, Schær. lirellæ suborbicular, *innate, im marginate, plane.*

On ash trees, not common.
SYN :—Schær. Spic. 328. (1823.) En. 156.
FIG :—Hepp t. f. 47.

Exs :—Nyl. 80. Hepp 47. Zw. 7. Schær. 633.
Geog. Distrib :—France, Switzerland, Germany.
Bot. Prov :—5.
England :—Red Hill! Weir Coppice! near Shrewsbury. (1870.)

6. *O. atra*, Pers. thallus very thin, forming *smooth, pale-yellow or whitish ocellate patches; lirellæ densely crowded towards the centre of the thallodal spot*, sessile, depressed, *lying in all directions* or sub-parallel, linear, generally simple or confluent, flexuose; epithecium narrow, uniform, rimæform, more or less open and canaliculate; proper margin thick, elevated, wavy; *spores* 8, colourless, *obovato-fusiform*, somewhat pointed at the extremities, 3-septate, *very minute*.

On trees, common.

Syn :—Pers. in Ust. Ann. Bot. st. 7. p. 30. (1794.) Nyl. Scand. 254. Leight. Br. Graph. p. 18. Mudd Man. 232.
Fig :—Hoffm. En. t. 3. f. 2. c. Leight. Br. Graph. t. 5. f. 11.
Exs :—Anzi It. S. 335.
Geog. Distrib :—France, Switzerland, Germany, Hungary, Italy, Asia, Africa, America.
Bot. Prov :—1, 2, 3...5...7, 8...14, 15...19...30, 31.
England :—Sussex! *Mr. Borrer*. Gopsall! Leicestershire. *Rev. A. Bloxam*. Budleigh Salterton. *Dr. Dickie*. Fordham, Essex. *Mr. Varenne*. Plymouth and Edenbridge, Kent. *Mr Holmes*. St. Leonard's Forest; New Forest; Epping Forest. *Rev. J. M. Crombie*. Weir Coppice! near Shrewsbury, Shropshire.
Scotland :—Near Edinburgh! *Dr. Greville*. near Stirling; Callander; Blair Athole; Lochaber. *Rev. J. M. Crombie*.
Ireland :—Dunkettle! Cork. *Mr. Carroll*. Knocknagoney! Colin Glen! Belfast; Massareene Park! co. Antrim. *Mr. Thompson*.
Wales :—Craig Breidden! Montgomeryshire; Gwydir Woods! Bettws-y coed, Trefriw!
Channel Islands :—Jersey and Guernsey. *Mr. Larbalestier*.
"Spores .003 to .0035 in. long, .00075 in. broad." (*Mudd.*) "Spores .015—17 mm. long, .004—6 mm. broad." *(Nyl.)* Spores .0145—.020 mm. long, .004 mm. broad.

forma *denigrata*, (Ach.) *lirellæ* more or less *crowded* and numerous, *irregularly scattered*, simple or branched.

On ash and sycamore trees, common.

Syn :—Ach. Meth. 27. (1803.) Syn. 75. Mudd Man. 232.
Fig :—E. Bot. 1753. (in part).
Exs :—Nyl. 143. Schær. 461. Mudd 208. M. & N. 469.
Geog. Distrib :—France, Switzerland, Sweden, Hungary.
Bot. Prov :—1, 2, 3...6, 7...10...15...(19—30)...31.
England :—Near Ayton! Cleveland. *Mr. Mudd*. Exeter. *Mr. Parfitt*. Marks Hall, Essex. *Mr. Varenne*. New Forest. *Rev. J. M. Crombie*. Nesscliffe Hill! Shropshire.
Scotland :—Near Stirling. *Rev. J. M. Crombie*.
Ireland :—Frequent. *Mr. Carroll*.
Wales :—Craig Breidden! Montgomeryshire. Gwydir Woods! Bettws-y-coed. Trefriw! Builth! Fishguard! Pembrokeshire.
Channel Islands :—Jersey and Guernsey. *Mr. Larbalestier*.

forma *nigrita*, Leight. *lirellæ* densely crowded and confluent into *irregular black central masses*.

On ivy, yew, ash, sycamore, frequent.

Syn :—Leight. Br. Graph. 18. in part. (1853.) Mudd Man. 232.
Fig :—Chev. Hist. Graph. t. 3. f. 6. d.
Exs :—Leight. 193. Mudd 210.
Geog. Distrib :—Belgium.
Bot. Prov :—1, 2, 3...5...7...10...15...16.
England :—Netley Abbey! Hants. *Mr. Lyell*. Sussex! *Mr. Borrer*. East-

bourne. *Mr. Roper.* Shropshire! *Rev. T. Salwey.* Essex! *Mr. Pigott.* Yorkshire! *Mr. Dixon.* Airyholme Wood! near Ayton! Cleveland. *Mr. Mudd.* Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Tong Priory! Shelton! near Shrewsbury, Llanymynech Hill! Shropshire.

SCOTLAND :—Callander; Appin. *Rev. J. M. Crombie.*

WALES :—Conway! Bettws-y-coed! Trefriw! Llanrochwyn Churchyard!

forma *parallela*, Leight. lirellæ lineari-elongate, *horizontally parallel.*

On cherry, hazel, &c., not unfrequent.

SYN :—*Opegrapha Cerasi & Coryli*, Chev. Fl. Par. 1. 521. (1836.) Mudd Man. 232.

FIG :—Chev. Hist. Graph. t. 1. f. 3. & 4. t. 2. f. 1. & 2.

EXS :—Mudd 209. Leight. 245.

GEOG. DISTRIB :—France, Belgium, Normandy.

BOT. PROV :—1, 2, 3...5...7...10...19...26...31.

ENGLAND :—Sussex! *Mr. Borrer.* Yorkshire! *Mr. Dixon.* Cockshaw Bank! Cleveland. *Mr. Mudd.* Torquay! Devon. *Dr. Deakin.* New Forest. *Rev. J. M. Crombie.* Woodham Walter, Essex. *Mr. Varenne.* near Compton place, Eastbourne. *Mr. Roper.* Abdon! Loppington! Shropshire.

SCOTLAND :—Near Stirling. *Rev. J. M. Crombie.*

IRELAND :—Castlebernard. *Prof. Hincks.* Fermoy! *Mr. Carroll.* Delphi, Connemara. *Mr. Larbalestier.*

WALES :—Gwydir woods! Bettws-y-coed.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier.*

forma *herbarum*, Mont. yellowish or whitish; *lirellæ* erumpenti-innate, flexuose, simple, *lineari-elongate, longitudinally sub-parallel; epithecium rimæform.*

On stems of various flowering plants (Teucrium Scorodonia) and ferns, rare.

SYN :—Mont. Arch. de Bot. 1833. p. 302. Syllog. 350. Schær. En. 153.

FIG :—Arch. Bot. t. 15. f. 1.

GEOG. DISTRIB :—France.

BOT. PROV :—19.

IRELAND :—Muckruss, Killarney. *Mr. Carroll.*

forma *hapalea*, Ach. lirellæ confluent, *epithecium deplanate.*

On various trees, elder, not frequent.

SYN :—Ach. Syn. 79. (1817.) Nyl. Prodr. 158.

FIG :—Chev. Hist. Graph. t. 6. fig. 1. a.

EXS :—M. & N. 649. Schær. 586. Anzi It. S. 336. 337.

GEOG. DISTRIB :—Switzerland, Italy, Pyrenees, Hungary.

BOT. PROV :—2...5, 6...19.

ENGLAND :—Sussex! *Mr. Borrer.* Holly Bush Hill! Malvern range. *Mr. Lees.* Epping Forest. *Rev. J. M. Crombie.*

IRELAND :—Carrigaloe, Cork. *Mr. Carroll.*

WALES :—Fishguard! Pembrokeshire.

forma *arthonoidea*, Leight. *lirellæ* difformed, confluent in irregular sub-stellate *scattered deplanate spots.*

On various trees, ash, holly, poplar, not common.

SYN :—Mudd Man. 232. (1861.)

EXS :—Leight. 338. Schær. 463. 634.

GEOG. DISTRIB :—Switzerland, Italy, Hungary, Pyrenees.

BOT. PROV :—1, 2, 3...5, 6, 7.

ENGLAND :—Devon. *Dr. Dickie.* Marks Hall, Essex. *Mr. Varenne.* Epping Forest. *Rev. J. M. Crombie.* Llanymynech! Holly Park near Stokesay! Shropshire.

WALES :—Conway! Gwydir woods! Bettws-y-coed. Builth! Dolgelley! Edderton! Montgomeryshire.

forma *ochrocheila*, Nyl. *margins of lirellæ ochraceous ;* epithecium expanded, plane.

On ivy, elm, and grass, rare.

SYN :—Nyl. in Flora 1865. p. 212.
GEOG. DISTRIB :—France.
BOT. PROV :—5, 6...19...31.
ENGLAND :—Arkoll Hill ! Shropshire.
IRELAND :—(Saxicole.) Dinish ! Killarney. *Mr. Hardy.*
WALES :—Builth ! Radnorshire.
CHANNEL ISLANDS :—L'Ancresse Common, Guernsey ! ; St. Peter's Valley ! Meadow Bank, Jersey. *Mr. Larbalestier.*
"Spores .014—15 mm. long, .004—5 mm. broad." (*Nyl.*) Spores .016 mm. long, .003—.004 mm. broad.

forma *tenuior*, Nyl. lirellæ *very slender and narrow*, simple or slightly branched, elongate, straight and curved.

On ivy, rare. 1876.

BOT. PROV :—26.
IRELAND :—Killery Bay, Galway. *Mr. Larbalestier.*

7. *O. atrula*, Nyl. scarcely any thallus ; *lirellæ* black, *oblong, short, simple, linearly arranged* ; epithecium rimæform ; spores 8, colourless, fusiformi-oblong, 3-septate.

On dry micaceo-schistose stones in shady places, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 565.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1877.)
"Spores .016 mm. long, .0035 mm. broad." (*Nyl.*)

8. *O. atricolor*, Strtn. *whitish*, very thin, *indeterminate ; lirellæ black, innato-sessile, narrow*, generally simple, somewhat acute, internally cinerascent or pallido-fuscescent ; epithecium at first *rimæform then* somewhat *concave or* even *explanate*, rugulose ; *spores* 4-8, colourless, oblongo-ovoid, 3-septate ; paraphyses indistinct, irregular, apices fuscous ; hypothecium fuscous-black.

On decorticated wood. 1875.

SYN :—Stirton in Trans. Glasgow Soc. Nat. p. 89. (1875.)
BOT. PROV :—17.
SCOTLAND :—Near Altnaharra co. Sutherland. *Dr. Stirton.* (1875.)
"Spores .015—.021 mm. long, .004—.0055 mm. broad. Hymenium and especially the subhymeneal stratum K purple. Upper part of hymenium I persistently blue, lower part yellow and vinoso-rubescent then vinous-red. Allied to *O. atra.*"

9. *O. Turneri*, Leight. pale-dirty-yellow, fusco-limitate ; *lirellæ very prominent, sessile, mostly simple, slender and linear ; epithecium very narrow, uniform ;* proper margin plump, rounded and incurved ; *spores* colourless, *lineari-obovate*, 3-*septate*.

On trees, sycamore, poplar, hazel, ash, elder, birch, frequent.

Quite distinct from *O. varia f. rimalis.*
SYN :—Leight. Br. Graph. 17. (1853.) *O. atrorimalis*, Nyl. in Flora 1864. p. 488. Mudd Man. 231.
FIG :—E. Bot. 2281. Leight. Br. Graph. t. 5. f. 10.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3, 4, 5...7...10...15...19...29, 30.
ENGLAND :—Hurstpierpoint ! Sussex ; Bradwell ! Burgh ! Suffolk ! *Mr. Borrer.* New Forest ! Hants. *Mr. Lyell.* near Worcester ! *Mr. Lees.* Cliffrigg ! Ingleby Park. Cleveland. *Mr. Mudd.* Essex ! *Mr. Piggott.* Highbeech, Epping Forest ! *Rev. J. M. Crombie.* Colne, Essex. *Mr. Varenne.* Holton Park ! near

Oxford. *Mr. Larbalestier.* Loppington! Haughmond Hill! Dorrington! Shropshire.

SCOTLAND:—Craig Tulloch. Blair Athole! *Rev. J. M. Crombie.*

IRELAND:—North of Ireland! *Miss Hutchins.* Colin Glen! Brett's Glen! Belfast. *Mr. Thompson.* Browne's demesne, Riverstown near Cork! *Mr. Carroll.*

WALES:—Capel Curig! Edderton! Montgomeryshire; Gwydir Woods! Bettws-y-coed. Trefriw! Craig Breidden!

Spores .019 mm. long, .005 mm. broad.

10. *O. confluens*, (Ach.) *greyish-green*, effuse, very thin, often obsolete; *lirellæ sessile, simple*, black, opake, *thick, cylindrical*, straight, or oftener curvate and contorted, very rarely solitary, scattered, *generally crowded or conglobate*; epithecium narrow, rimæform, sub-dilatate in age; margin at first rotundate, inflexed, presently acute; paraphyses septate, branched; spores 8, colourless, elongato-oval or soleæform, 3-septate.

On sub-alpine rocks, rare.

SYN:—*O. lithyrga, var. confluens*, Ach. L. U. p. 247. (1810.) Stizb. Stein. Opeg. 22.

FIG:—Stizb. Stein. Opeg. t. 2. f. 1. a—m.

EXS:—Nyl. 144. Anzi Etr. 36. Rabh. 339.

GEOG. DISTRIB:—Switzerland.

BOT. PROV:—1, 2...6...15...19...26.

ENGLAND:—St. Michael's Mount, Penzance, and near Hastings. *Mr. Holmes.*

SCOTLAND:—Craig Tulloch. *Rev. J. M. Crombie.*

IRELAND:—Southern Counties. *Mr. Carroll.* Lettermore! *Mr. Larbalestier.*

WALES:—Goodwick Bay! Pembrokeshire.

11. *O. saxicola*, Ach. dirty-white or rusty-brown; *lirellæ oblong or ovate*, deformed, *short, obtuse*, variously branched, *rounded or triquetrous*, wider at one extremity; epithecium rimæform more or less expanded; proper margin tumid, round and incurved; spores 8, colourless, lineari-oblong or lineari-clavate, rounded at each extremity, 3-septate.

On rocks, frequent.

SYN:—Ach. Syn. 71. (1817.) Nyl. Scand. 254. Stizb. Stein. Opeg. 23. *O. rupestris*, Pers. Ust. Ann. xi. 20. Leight. Br. Graph. 11. Mudd Man. 228.

FIG:—E. Bot. 2345. Leight. Br. Graph. t. 5. f. 5.

EXS:—Schær. 94. Leight. 243. Zw. 145. A. Arn. 104.

GEOG. DISTRIB:—Normandy, Italy, Germany, Pyrenees, Madeira.

BOT. PROV:—1, 2...5, 6, 7...10...19...26...29, 30, 31.

ENGLAND:—Netley Abbey! *Mr. Lyell.* Newton Wood! Yorkshire. *Mr. Baker.* Nent Force! Cumberland. *Mr. Robertson.* Plymouth. *Mr. Holmes.* Nesscliff Hill! Downton Castle Woods! Llanyblodwel Rocks! Craigforda! Shropshire.

IRELAND:—North of Ireland! *Miss Hutchins.* Larne! co. Antrim. *Mr. Thompson.* Muckruss! Rostellan! Cork Harbour. *Mr. Carroll.* Doughruagh Mountain! co. Galway. *Mr. Larbalestier.*

WALES:—Barmouth! *Rev. T. Salwey.* Great Orme's Head! Castle Dinas Bran! Pwll Dhu Head! Caswell Bay, Mumbles. Fishguard Harbour! Goodwick Bay! Pembrokeshire.

CHANNEL ISLANDS:—Near Ann Port; Boulay Bay; Rozel Meadow; Noirmont, Jersey. *Mr. Larbalestier.*

"Spores .003 in. long, by .00075 in. broad." (*Mudd.*) Spores .017—.019 mm. long, .005 mm. broad.

Var. *De Candollei*, Stizb. whitish or dirty-rusty-brown; lirellæ linear, lineari-oblong, oblong or ovate, expanded, obtuse at the extremities, chiefly simple and straight, dark-brown; spores 8, colourless, narrow, lineari-oblong, round at each extremity, 3-septate.

On rocks, rare.

SYN :—Stizb. Stein. Opeg. 29. (1865.) *Op. saxigena*, Tayl. Fl. Hib. 2. 259. Leight. Br. Graph. 13. *O. saxatilis*, DC. Fl. Fr. 2. 312. *Verrucaria umbrosa*, Tayl.
FIG :—Leight. Br. Graph. t. 5. f. 7.
EXS :—Leight. 311. Anzi Langob. 406. Anzi Venet. 104.
GEOG. DISTRIB :—France, Italy, Hungary.
BOT. PROV :—1...7...19...24...26.. 31.
ENGLAND :—Torquay. *Mr. Parfitt.*.
IRELAND :—Dunkerron ! *Dr. Taylor.* Kerry. *Dr. Moore.* Croghain ! Killarney ; Kilkee, co. Clare. *Mr. Carroll.* Doughruagh Mountain ! Delphi near Tully, Twelve Pins ! Kylemore Castle, Galway. *Mr. Larbalestier.*
WALES :—Nant Gwynant ! *Mr. Holmes.* Trefriw ! Llyn Geirionedd !
CHANNEL ISLANDS :—Boulay Bay, Jersey. *Mr. Larbalestier.*
Spores .021—.022 mm. long, .005 mm. broad.

Var. *Chevallieri*, Leight. *white or pale-yellow ; lirellæ* simple, *linear, elongated, curved* or bent back, *flexuose* and wavy, black, *crowded or conglomerate*, shining, obtuse at the extremities ; paraphyses distinct, slender ; spores 8, colourless, broadly clavate, rounded at each extremity, 3-septate.

On rocks, frequent. 1807.

SYN :—Leight. Br. Graph. 10. (1853.) *Opeg. calcarea*, Turn. in E. Bot. 1790. (1807.)
FIG :—Leight. Br. Graph. t. 5. f. 4. E. Bot. t. 1790. Stizb. Opeg. t. 1. f. 5.
EXS :—Leight. 67. Larbal. 44. Anzi Etr. 37. Mudd 203.
GEOG. DISTRIB :—Belgium, Italy, Normandy.
BOT. PROV :—1, 2, 3, 4, 5, 6, 7...10...12...14...23, 24...30, 31.
ENGLAND :—Netley Abbey ! *Mr. Lyell.* North of England ! *Rev. J. Harriman.* Craigforda ! near Oswestry, Shropshire. *Rev. T. Salwey.* Tantallon Castle ! *Dr. Lindsay.* Roseberry ! Cleveland. *Mr. Mudd.* Suffolk ! *Sir Thos. Gage.* Budleigh Salterton, Devon. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Kingsbridge ! S. Devon. *Dr. Holl.* Old Eastbourne. *Mr. Roper.*
SCOTLAND :—Caroline Park, Edinburgh. *Dr. Burchell.*
IRELAND :—Killarney ! *Miss Hutchins.* near Dublin ! Derriquin ! co. Kerry. *Dr Taylor.* Colin Glen, Belfast. *Mr. Thompson.* Ross ! co. Clare ; near Lighthouse, Cork Harbour ! *Mr. Carroll.* near Letterfrack ! Lough Corrib ! Salrock ! Ballynakill ! Galway. *Mr. Larbalestier.*
WALES :—North Wales ! *Rev. Hugh Davies.* Llanaber ! Barmouth ! Pembrokeshire ! *Rev. T. Salwey.* Cape St. Vincent Rock, between Aberdovey and Towyn ! *Rev. A. Bloxam.* Great Orme's Head ! South Stacks ! Holyhead ! Aber ! Goodwick Bay ! Pembrokeshire. Giltar Point ! and Manorbeer ! near Tenby.
CHANNEL ISLANDS :—Guernsey ; Noirmont Warren ; St. Ouen's and St. Saviour's, Jersey ! *Mr. Larbalestier.*
Spermatia straight or slightly curved, cylindrical. Spores .017 –.019 mm. long, .006 mm. broad.

forma *heteromorpha*, Hepp. *athalline ; lirellæ very long and broad, acuminate* at the extremities.

On maritime rocks. 1875.

SYN :—Stizenb. Opeg. p. 21. (1865.)
FIG :—Stizenb. l. c. tab. 5. α—ξ.
BOT. PROV :—23...26.
IRELAND :—Killery Bay ! Connemara. *Mr. Larbalestier.* (1875.) Dublin. *Dr. Moore.*

forma *gyrocarpa*, (Zw.) greyish ; apothecia sessile, *rotundato-deformed ; epithecium gyroso-plicate.*

SYN :—Flotow in Flora 1825. p. 345. Körb. Syst. 280.
FIG :—Stizb Stein. Opeg. t. 2. f. 2 κ. λ. μ—ο.
GEOG. DISTRIB :—Hungary, Germany.
BOT. PROV:—2, 3...7...15...19...23.

ENGLAND :—Shanklin, Isle of Wight. *Dr. Holl*, Maidstone, Kent. *Mr. Holmes.*
SCOTLAND :—Craig Guie, Grampians. *Rev. J. M. Crombie.*.
IRELAND : —Mangerton, Killarney. *Mr. Carroll.* Kylemore Castle ! *Mr. Larbalestier.*
WALES :—Bettws-y-coed ! Llyn Geirionydd ! Trefriw ! Llyn Gwernan !
CHANNEL ISLANDS :– Boulay Bay ! Jersey. *Mr. Larbalestier.*

Var. *Persoonii*, Ach. white or albicant, thin, opake, sub-leprose, unequal ; lirellæ oblong, small ; epithecium plicæform or at length subdehiscent, often rugose and deformed ; spores 8, colourless, fusiform, 3-septate.

On calcareous rocks, rare.

SYN :—Ach. Meth. 17. *Lichen Persoonii*, Ach. Prodr. 19. Nyl. Scand. 254· (excl. Syn. Leight. Br. Graph.)
GEOG. DISTRIB :—Sweden.
BOT. PROV :—24.
IRELAND :—Kilkee, co. Clare. *Mr. Carroll.*
"Spores .021—25 mm. long, .006—7 mm. broad." (*Nyl.*)

12. *O. grumulosa*, Duf. *white, farinaceous, thick*, (K faint yellow, C red) ; *apothecia cæsio-pruinose*, lanceolate or deformed, normally marginate, *internally black* ; *spores* 8, colourless, *oblongo-fusiform*, 3-*septate*.

On rocks, rare.

SYN :—Duf. Journ. Phys. 1848. vol. 87. p. 214. Nyl. Prodr. 152.
FIG :—Grevillea 2. t. 26. fig. 2.
EXS :—Zw. 9. 142. 144. Anzi Langob. 404. Anzi Venet. 82. 83. Schær. 580.
GEOG. DISTRIB :—France, Germany, Italy, Algeria.
BOT. PROV :—1...31.
ENGLAND :—South Devon ! *Prof. Dickie.* Valley of Rocks. *Mr. Holmes.*
CHANNEL ISLANDS :—La Coupe ; Rozel, Jersey. Walls of Old Nunnery, Alderney. *Mr. Larbalestier.*
"Spores .011—17 mm. long, .003—4 mm. broad." (*Nyl.*) Spores .018 mm. long, .005 mm. broad.

13. *O. contexta*, Strn. *rufo-cervine*, thin, limited by the brown hypothallus ; *apothecia* black, small, generally aggregate, *gyroso-plicate, almost lecideiform*, internally cinereo-fuscous ; hypothecium fuscous-black ; epithecium rimæform ; spores 8, colourless, fusiform, apices blunt, 3-septate, moderate ; paraphyses very indistinct ; lower half of hymenium I cærulescent then vinous-red.

On elm, rare. 1874.

SYN :—Stirton in Grevillea 3. p. 35. (1874.)
BOT. PROV :—15.
SCOTLAND :—Near Grantown, Inverness. *Dr. Stirton.* (1874.)
"Spores .017—.025 mm. long, .0045 mm. broad." (*Stirt.*)

14. O. *prosiliens*, Strn. *white* or whitish, very thin, chrysogonidic ; apothecia black, prominent, *ovate or oblong ;* epithecium rimæform, margins prominent, rounded ; spores 8, colourless, *fusiformi-ellipsoid*, 3-*septate*, *generally* 4-*nucleate*, *surrounded by a gelatinous halo*, rather large ; paraphyses distinct, branched, apices fuscescent ; gelatina hymenea I slightly-blue then vinous-red.

On dead decorticated trees, rare. 1874.

SYN :—Stirton in Grevillea 3. p. 36. (1874.)
BOT. PROV :—15.
SCOTLAND :—Near Grantown, Inverness. *Dr. Stirton.* (1874.)
"Spores .02—.028 mm. long, .006—.007 mm. broad." (*Stirt.*)

15. *O. xanthodes*, Nyl. *yellow or flavo-cinerascent*, thin, somewhat smooth, *rimose; lirellæ black, oblong;* epithecium rimæform; *spores* 8, colourless, *fusiformi-oblong*, 3-*septate;* hypothecium and perithecium nigricant.

On quartzose rocks, rare. 1877.

SYN :—Nyl. in Flora 1878. p. 245.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1877.)
"Spores .015—18 mm. long, .005–6 mm. broad. Gelatina hymenea I vinous fulvous-red. Spermatia straight, .004 mm. long, scarcely .001 mm. broad." (*Nyl.*)

*** *Spores* 5-*septate.*

16. *O. varia*, Pers. *thallus white, pulverulent; lirellæ prominent, sessile, round, oblong, elliptical, elongate, attenuated at each end; epithecium canaliculate or dilated in the middle, or plane and convex;* proper *margin prominent, inflexed*, sometimes subevanescent; *spores* 8, colourless, irregularly obovate or obovato-fusiform, 5-*septate.*

Spores .024—.026 mm. long, .007 mm. broad.

The following are the principal states of this very variable species.

forma *pulicaris*, Lightf. *lirellæ oval, oblong or elliptical, minute, simple; epithecium concave, dilated in the middle* proper margin persistent, inflexed.

On various trees, common.

SYN :—Lightf. Fl. Scot. 2. 801. (1777.) Nyl. Scand. 253. Leight. Br. Graph. 14. Mudd Man. 230.
FIG :—Ach. Meth. t. 1. f. 9. Chev. Graph. t. 14. f. 3. & 4. Leight. Br. Graph. t. 5. f. 9.
EXS :—Schær. 97. 518. 520. Zw. 5. A. C. Nyl. 73. 74. Anzi It. S. 329. 330. 331. Hepp 892. 166. M. & N. 954.
GEOG. DISTRIB :—Sweden, Switzerland, France, Italy, Hungary, Normandy, Germany, Belgium, Pyrenees, Algeria.
BOT. PROV :—1, 2, 3...5...15...19...24...31.
ENGLAND :—Sussex! *Mr. Borrer.* New Forest! Hants. *Mr. Lyell.* Kelvedon, Essex. *Mr. Varenne.* Stoke Wood, Devon. *Mr. Parfitt.* Plymouth, Wye, Maidstone, Kent. *Mr. Holmes.* Epping Forest! near Exeter. *Rev. J. M. Crombie.* Abdon! Bickley Coppice! near Shrewsbury, Llanyblodwel rocks! Shropshire.
SCOTLAND :—Near Stirling; Killin; Banchory in Aberdeen. *Rev. J. M. Crombie.*
IRELAND :—Castleconnel near Limerick! co. Clare; Rostellan, Cork. *Mr. Carroll.*
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

forma *notha*, Ach. *lirellæ round or oblong, deformed, large; epithecium plane* or convex, obliterating the proper margin.

On oak, common.

SYN :—Ach. Prodr. 19. (1798.) Syn. 76. Nyl. Scand. 253. Leight. Br. Graph. 15. Mudd Man. 230.
FIG :—E. Bot. 1890. Leight. Br. Graph. t. 5. f. 9.
EXS :—M. & N. 857. Schær. 282. Leight. 66. Hepp 165. Nyl. 75. Anzi It. S. 327. Larbal. 91.
GEOG. DISTRIB :—France, Switzerland, Belgium, Italy, Normandy, Austria, Germany.
BOT. PROV :—1, 2, 3, 4, 5...10, 11...15...26...31.

ENGLAND :—Yarmouth. *Mr. Turner.* (1808.) Epping Forest. *Rev. J. M. Crombie.* Sussex ! *Mr. Borrer.* High Vawr Lane, Oswestry, Shropshire. *Rev. T. Salwey.* Ingleby ! Cleveland. *Mr. Mudd.* Teesdale ; Cawsey Wood, Durham ; Hexham and Corbridge, Northumberland. *Mr. Winch.* Berwick. *Dr. G. Johnston.* Red Hills, Exeter. *Mr. Parfitt.* Rora and Penn Wood, Devon. *Messrs. Jones & Kingston.* Eynsford, Kent. *Mr. Holmes.* The Bartons, Ledbury ! (*saxicole*), *Dr. Holl.* Montford Bridge ! near Shrewsbury ; Haughmond Hill ! base of Caer Caradoc ! Heywood Forest near Ludlow ! Downton Castle Woods ! Shropshire.

SCOTLAND :—Near Stirling. *Rev. J. M. Crombie.*

IRELAND :—Cleghan ! Connemara. *Mr. Larbalestier.*

CHANNEL ISLANDS :—(Saxicole) La Coupe, Jersey ! *Mr. Larbalestier.*

forma *diaphora*, Ach. *lirellæ elongate, attenuate at both extremities ;* epithecium *plane* ; proper margin persistent, flexuose.

On oak, ash, sycamore, frequent.

SYN :—Ach. Prodr. 20. (1798.) Syn. 77. Nyl. Scand. 253. Leight. Br. Graph. 15. Mudd Man. 231.

FIG :—Leight. Br. Graph. t. 5. f. 9.

EXS :—Schær. 98. 519. M. & N. 468. 556. Leight. 220. Anzi It. S. 328. 332. Zw. 4. Mudd 206. Nyl. 76. 77.

GEOG. DISTRIB :—Switzerland, Germany, Italy, Hungary, Belgium, Pyrenees France, Sweden.

BOT. PROV :—1, 2, 3...6...10, 11...15...(19—30)...31.

ENGLAND :—Sussex ! *Mr. Borrer.* Kildale ! Easby Wood ! Airyholme Wood ! Cleveland. *Mr. Mudd.* Mill Hill, Middlesex ; Lyndhurst ; New Forest ; Epping Forest. *Rev. J. M. Crombie.* Weardale ; Teesdale ; Ravensworth and Caswey Woods, Durham. *Mr. Winch.* Whitstone Hill, Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Penn and Rora Woods, Devon. *Messrs. Jones & Kingston.*

SCOTLAND :—Near Stirling ; Killin. *Rev. J. M. Crombie.*

IRELAND :—Frequent. *Mr. Carroll.*

WALES :—Builth ! Radnorshire.

CHANNEL ISLANDS ;—Jersey and Guernsey. *Mr. Larbalestier.*

forma *tigrina*, Ach. *lirellæ linear-oblong, obtuse at the extremities ;* epithecium *canaliculate*, nearly uniform ; proper margin persistent, rounded and inflexed.

On various trees, elm, oak, beech, not unfrequent.

SYN :—Ach. L. U. 262. (1810.) Leight. Br. Graph. 16. Mudd Man. 230.

FIG :—E. Bot. 2280. Leight. Br. Graph. t. 5. f. 9.

EXS :—Bohl. 52. Leight. 287. Mudd 205.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3, 4, 5...10...26...31.

ENGLAND :—New Forest ! Hants. *Mr. Lyell.* Hurstpierpoint, Sussex ! Haddisco, Norfolk ! Coulsdon, Surrey ! *Mr. Borrer.* Kildale ! Yorkshire. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* Thame Park ! Oxfordshire. *Mr. Larbalestier.* Nesscliff ! Haughmond Hill ! Shropshire.

IRELAND :—Glendalough ! Connemara. *Mr. Larbalestier.*

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier.*

forma *tridens*, Ach. *lirellæ elongate, stellate ;* epithecium *canaliculate ;* proper margin persistent, rounded and inflexed.

On various trees, beech, elm, rare.

SYN :—Ach. L. U. 263. (1810.) Syn. 79. Leight. Br. Graph. 16. Mudd Man. 230.

FIG :—Leight. Br. Graph. t. 5. f. 9.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2, 3...31.

ENGLAND :—New Forest ! Hants. *Mr. Lyell.* Sussex ! *Mr. Borrer.* Kelvedon Essex. *Mr. Varenne.*

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier.*

forma *rimalis*, (Fr.) *lirellæ linear-elongate, acuminate*, sessile, prominent, *minute ;* epithecium *canaliculate*, margin elevated and inflexed.

On trees, ash, oak, hazel, elder, frequent.

Not to be confounded with *O. Turneri*.
SYN :—Fries L. Ref. 365. (1831.) Nyl. Scan. 253. Mudd Man. 231.
EXS :—Leight. 192. Mudd 207.
GEOG. DISTRIB :—Sweden, France.
BOT. PROV :—1, 2...8...10...15...(19—30)...31.
ENGLAND :—Kildale ! Yorkshire. *Mr. Mudd.* (saxicole) Fulking Roadside ! Sussex. *Mr. Larbalestier.* Gopsall, Leicestershire. *Rev. A. Bloxam.* Lyndhurst ! New Forest. *Rev. J. M. Crombie.* Red Hills, Exeter. *Mr. Parfitt.*
SCOTLAND :—Blair Athole. *Rev. J. M. Crombie.*
IRELAND :—Frequent. *Mr. Carroll.*
CHANNEL ISLANDS :—Noirmont ; Belcroute Bay, Jersey. *Mr. Larbalestier.*

forma *herbicola*, Nyl. lirellæ very slender, spores somewhat smaller.

On dead stems of *Osmunda regalis* and *Calluna vulgaris*, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 463.
BOT. PROV :—6...26.
IRELAND :—Doughruagh Mountain ! Galway. *Mr. Larbalestier.* (1876.)
WALES :—Llyn Gwernan ! near Cader Idris.

forma *ochrocheila*, Leight. *margins of lirellæ viridi-ochraceous.*

On brambles, rare. 1877.

BOT. PROV :—26.
IRELAND :—Doughruagh Mountain ! Galway. *Mr. Larbalestier.* (1877.)

17. *O. Cæsareensis, Nyl. white*, thin, *rimulose*, indeterminate ; *lirellæ* black, *cylindrical, prominent, simple, sub-flexuose ; epithecium rimæformi-constricted ; spores* 8, colourless, *oblong*, 5-*septate.*

On quartzose rocks, rare.

SYN :—Nyl. in Flora 1868. p. 477. Crombie En. 99.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...31.
ENGLAND :—The Lizard, Cornwall. *Mr. Curnow.*
CHANNEL ISLANDS :—Noirmont, Jersey ! E. coast of Jersey very near Rozel ! *Mr. Larbalestier.*
"Spores .016—22 mm. long, .004—5 mm. broad." (*Nyl.*) Spores .017—.021 mm. long, .004 mm. broad.

18. *O. areniseda*, Nyl. thallus scarcely any or most obsoletely externally visible ; *lirellæ black, linear, subgyrosely conglomerate in difformed pulvinate heaps*, epithecium narrow ; spores 8, colourless, fusiform, 3-5-septate ; hypothecium black ; gelatina hymenea I vinoso-rubescent.

In crevices of walls, rare. 1873.

SYN :—Nyl. in Flora 1875. p. 446.
BOT. PROV :—31.
CHANNEL ISLANDS :—St. John's, Jersey. *Mr. Larbalestier.* (1873.)
"Spermogonia heaped together in small black glomerules ; spermatia straight, .0035—45 mm. long, .0010 mm. broad. Spores .014—16 mm. long, .004 mm. broad." *(Nyl.)*

19. *O vulgata*, Ach. *greenish-white*, cartilagineo-membranaceous, cracked and scaly, *effuse ; lirellæ prominent* and sessile, *variable in size*, shorter ones roundish or oblong, longer ones slender

and linear, simple, wavy and shining or greasy; epithecium rimæform, uniform; proper margin thick, very round and inflexed; *spores* 8, colourless, *fusiform*, 5-*septate*.

forma *vulgata*, Ach. *lirellæ small, numerous, but regularly scattered*; *epithecium rimæform, more or less expanded.*

On various trees, apple, ash, willow, birch, yew, fir, holly, common. 1807.

SYN:—Ach. Prodr. 21. (1798.) Syn. 73. Nyl. Scand. 255. Leight. Br. Graph. 23. Mudd Man. 232.

FIG:—E. Bot. 1811. Leight. Br. Graph. t. 5. f. 13. a. b.

EXS:—Bohl. 127. Schær. 516. Fries L. S. 280. (fide Nyl.) Leight. 194. Anzi It. S. 333. Mudd 211. Rabh. 820. Zw. 407.

GEOG. DISTRIB:—Sweden, Germany, France, Switzerland, Italy, Normandy, Belgium, Calcutta, Amazons, N. America.

BOT. PROV:—1, 2, 3...5...7...10, 11...14, 15...19...26...31.

ENGLAND:—Hurst and St. Leonard's Forest; Sussex! *Mr. Borrer.* New Forest. *Rev. J. M. Crombie.* Malvern Hills! Worcestershire. *Mr. Lees.* Berwick-on-Tweed. *Dr. G. Johnston.* Easby Wood! Cleveland. *Mr. Mudd.* Northumberland and Durham. *Mr. Winch.* Haldon, Exeter. *Mr. Parfitt.* Woodham Walter; Braxted; Messing, Essex. *Mr. Varenne.* Plymouth. *Mr. Holmes.* Haughmond Hill! Weir Coppice! Red Hill! near Shrewsbury, Castle Hill Plantation! near Acton Scott, Shropshire.

SCOTLAND:—Lasswade! and near Edinburgh! *Dr. Greville.* Killin. *Rev. J. M. Crombie.*

IRELAND:—Near Derrycrimlry! *Mr. Carroll.* Lough Derryclare! co. Galway. *Mr. Larbalestier.*

WALES:—Bryn Maelgwyn! near Conway, Carnarvonshire; Penmaen-mawr! Torrent Walk, Dolgelley! Gwydir Woods! Bettws-y-coed. Trefriw! Rallt! near Welshpool. Edderton! Montgomeryshire. Craig Breidden!

CHANNEL ISLANDS:—St. Peter's Valley, Jersey, and on all the Islands. *Mr. Larbalestier.*

"Spores .005 to .006 in. long, by .00075 in. broad." (*Mudd.*) "Spores .015—20 mm. long, .003—4 mm. broad." (*Nyl.*) Spores .021 mm. long, .003 mm. broad.

forma *stenocarpa*, Ach. lirellæ long, slender and wavy, *densely crowded*; epithecium rimæform, very narrow, closed.

On various trees, oak, beech, elm, ash, fir, common.

SYN:—Ach. L. U. 257. (1810.) Syn. 75. Leight. Br. Graph. 24. Mudd Man. 232.

FIG:—Chev. Graph. t. 7. f. 5. c. t. 9. f. 1. Leight. Br. Graph. t. 5. f. 13. a. 1. b. 1.

EXS:—Zw. 6. 147. Schær. 93.

GEOG. DISTRIB:—Sweden, France, Germany, Switzerland, Italy, Bavaria.

BOT. PROV:—1, 2...5...7, 8...10...19...31.

ENGLAND:—Sussex! *Mr. Borrer.* New Forest! Hants. *Mr. Lyell.* Twycross! Leicestershire. *Rev. A. Bloxam.* Torquay! Devon. *Dr. Deakin.* Airyholme Wood! Newton! Cleveland. *Mr. Mudd.* Stoke Wood, Exeter. *Mr. Parfitt.* Weir Coppice! Shrewsbury! Shropshire.

IRELAND:—Near Cork! *Mr. Carroll.*

WALES:—Pen-maen-mawr! Trefriw!

CHANNEL ISLANDS:—St. Peter's Valley, Jersey. *Mr. Larbalestier.*

forma *subsiderella*, Nyl. *lirellæ radiato-ramose.*

On trees, rare.

SYN:—Nyl. Scand. 255.

FIG:—Chev. Graph. t. 7. f. 3. a.

EXS:—Nyl. 78. Mudd 212.

GEOG. DISTRIB:—France, Belgium.

BOT. PROV:—2, 3...5..7...10...19.

ENGLAND:—Near the Ham, Clayton! *Mr. Borrer.* Easby! Brantsdale! Yorkshire. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* Water lane, Eastbourne. *Mr. Roper.* Red Hill! near Shrewsbury! Shropshire.

IRELAND :—Rockgrove ! Cork. *Mr. Carroll.*
WALES :—Dolgelley !

forma *lithyrga*, Ach. thallus thin, white or whitish, continuous, *subfarinaceous*, subdeterminate.

On rocks, not common. 1849.

SYN :—Ach. L. U. 247. (1810.) Syn. 72. Nyl. Scand. 255.
EXS :—Zw. 3. 1. A. & B. Larbal. 43.
GEOG. DISTRIB :—Germany, Italy, Hungary.
BOT. PROV :—5...26...31.
ENGLAND :—Haughmond Hill ! Shropshire. (1849.)
IRELAND :—Dawros River ! co. Galway. *Mr. Larbalestier.*
CHANNEL ISLANDS :—L'Etacq Point ; Noirmont, Jersey. *Mr. Larbalestier.*

forma *steriza*, Ach. pallido-ochraceous, very thin or *evanescent ;* lirellæ simple, elongated, flexuose.

On rocks, not common. 1865.

SYN :—Ach. Syn. 72. (1817.) Nyl. Scand. 255.
EXS :—Zw. 30. 354. Rabh. 795. Larbal. 42.
GEOG. DISTRIB :—France, Switzerland, Germany, Italy.
BOT. PROV :—7...19...26...31.
IRELAND :—Croghan, Killarney. *Mr. Carroll.* Doughruagh Mountain ! Galway. *Mr. Larbalestier.*
WALES :—Moel-y-gest !
CHANNEL ISLANDS :—Noirmont ! Rozel, Jersey ; Eperquerie ! Sark. *Mr. Larbalestier.* (1865.)
*Opegrapha cinerea*, Chev. near Trinity Church, Jersey ! *Mr. Larbalestier.* 1873, appears to be only a sparse or scattered state of *O. vulgata*, the spores and spermatia being alike in both.

20. *O. hapaleoides*, Nyl. *cinereo-virescent* or *olivaceo-virescent*, thin, rimulose, subdeterminate ; *lirellæ black, somewhat shining*, slender, *stellato-ramose, apices obtuse;* epithecium rimæform, narrow, margins thick, inflexed ; spores 8, colourless, narrowly fusiform, 5-septate.

On trees, oak. 1869.

SYN :—Nyl. in Flora 1869. p. 296. Crombie in Journ. Bot. n. s. 2. 135.
BOT. PROV :—1...26.
ENGLAND :—Clifton, Somersetshire. *Mr. Larbalestier.* (1869.)
IRELAND :—Doughruagh ! *Mr. Larbalestier.*
"Spores .016—22 mm. long, .003 mm. broad." (*Nyl.*) Spores .022 mm. long, .003 mm. broad.

21. *O. zonata*, Kbr. *rufous or rufo-ferruginous*, thin, sub-tartareous, smoothish, *with numerous dirty pale-whitish-yellow soredia, limited* by conspicuous *elevated thickish nigro-fuscous lines* resulting from the confluence of the hypothallus of many adjacent thalli ; *lirellæ nigro-fuscous or black*, scattered, few, sessile ; spores 8, colourless, narrowly or attenuato-fusiform, 5-septate.

On shaded shaly mountain rocks, not common. 1871.

SYN :—Körb. S. L. G. 279. Par. 251. *Verrucaria horistica*, in part, Leight. L. Fl. 451.
EXS :—Anzi It. S. 326. Arn. 183.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...10.. 31.
ENGLAND :—Lounsdale ! Yorkshire. *Mr. Mudd.* (1858.)
WALES :—Wood opposite Tan-y-bwlch Hotel, Capel Curig ! Llyn Cwlyd ! Trefriw ! Bettws-y-coed !
CHANNEL ISLANDS—Boulay Bay ! Jersey. *Mr. Larbalestier.*

**** *Spores 7-septate.*

22. *O. Leightonii*, Crombie in litt. *chalky-white, pulverulent; lirellæ prominent*, rigid, straight or stellato-divergent, *tapering towards each extremity; epithecium* at first rimæform, then *dilated*; *proper margin thin, elevated;* spores 8, colourless, fusiform, 7-septate (sometimes 5 and 6.)

On calcareous and sandstone rocks, frequent. 1807.

Mr. Crombie has found in Sowerby's Herb. in Brit. Mus. the identical specimen of *Opegrapha calcarea* from Mr. D. Turner, duly named, localized and marked as drawn in Eng. Bot. On examination and comparison, it proves to be identical with *O. Chevallieri*, (Leight. Br. Graph. t. 5. f. 4.) having spores broadly clavate, rounded at each extremity, 3-septate. He proposes therefore to name the *Opeg. saxatilis*, Leight. Br. Graph. *Opegrapha Leightonii*, Crombie.

SYN :—*O. saxatilis*, Leight. Br. Graph. 9. excl. syn. *O. rimalis septennaria*, Nyl.!

FIG :—Leight. Br. Graph. t. 5. f. 3.

GEOG. DISTRIB ;—Europe.

BOT. PROV :—1, 2...4, 5...7...10, 11...19...31.

ENGLAND :—Netley Abbey! *Mr. Lyell.* Stone Farm rocks, Ardingley! Sussex. *Mr. Borrer.* Norfolk and Suffolk. *Sir J. E. Smith.* Newton Wood! Cleveland. *Mr. Baker.* Great Ayton! Yorkshire. *Mr. Dixon.* Ilsham! Torquay, Devon. *Dr. Deakin.* near Whitburn, Sunderland and Castle Eden, Durham; Wycliffe Church. *Mr. Winch.* Castle Barnard, Durham! *Rev. W. Johnson.* Aymestry! Herefordshire.

IRELAND :—Killarney! *Mr. Hardy.*

WALES :—Great Orme's Head!

CHANNEL ISLANDS :—La Coupe, Jersey. *Mr. Larbalestier.*

Spores .027—.031 mm. long, .005 mm. broad.

23. *O. lyncea*, (Sm.) *white*, tartareous, pulverulent; *lirellæ black, immersed, oblong or lineari-oblong*, rounded at each end, simple, curved; *epithecium plane, dilated, cæsio-pruinose; proper margin stout, elevated, wavy;* spores 8, colourless, fusiform, 7-septate.

On old oaks, not common. 1795.

SYN :—Smith in E. Bot. 809. (1800.) Leight. Br. Graph. 47. Nyl. Prodr. 151. Mudd Man. 229.

FIG :—E. Bot. 809. Leight. Br. Graph. t. 7. f. 25.

EXS :—M. & N. 1158. Bohl. 93. Zw. 422. Nyl. 71. Mudd 204. Leight. 195.

GEOG. DISTRIB :—Switzerland, France, Germany, Sweden, Italy, Brazils.

BOT. PROV :—1, 2, 3, 4, 5...7, 8...10, 11...31.

ENGLAND :—Hainault Forest, Essex. *Mr. Sowerby.* (1795.) near Windsor. *Mr. Turner.* Sussex! *Mr. Borrer.* New Forest! Hants. *Mr. Lyell.* Oswestry! Shropshire. *Rev. T. Salwey.* on the Bear's Oak! at Penshurst, Kent. *Mr. Thompson.* Northamptonshire. *Prof. Churchill Babington.* Hartshill Wood! near Atherstone; Donnington Park! Leicestershire. *Rev. A. Bloxam.* Thorndon Hall Park! Essex. *Mr. Piggott.* Great Malvern! Worcestershire. *Mr. Lees.* Hoggarts Wood! Cliffrigg! Cleveland. *Mr. Mudd.* near Bishop Auckland, Durham. *Rev. J. Harriman*, near Thirsk, Yorkshire. *Mr. Baker.* Topsham and Haldon, Exeter. *Mr. Parfitt.* Rivenhall; Kelvedon; Braxted, Essex. *Mr. Varenne.* Epping Forest. *Rev. J. M. Crombie.* Haughmond Hill! Shropshire.

WALES :—Edderton Wood! Montgomeryshire.

CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier.*

"Spores .006 to .007 in. long, by .00075 in. broad." (*Mudd.*) "Spores .023—31 mm. long, .003—.0045 mm. broad." (*Nyl.*) Spores .023—.025 mm. long, .004—.0045 mm. broad.

24. *O. lithyrgodes*, Nyl. *reddish-brown*, thin, continuous; *lirellæ black and shining, minute*, scattered, sessile, *oblong* or lineari-oblong, obtuse at the apices; epithecium rimæform, margin thickish, round, inflexed; spores 8, colourless, fusiform, 7-septate.

Under surface of rocks, rare. 1876.

SYN :—Nyl. in Flora 1875. p. 106.
EXS :—Arn. 418. (fide Nyl.)
BOT. PROV :—26.
IRELAND :—Lough Muck! Connemara. *Mr. Larbalestier.* (1876.)
Spores .032 mm. long, .006 mm. broad.

***** *Spores multi-septate.*

25. *O. amphotera*, Nyl. *pale-dusky-yellow* or tawny, thin, *sub-tartareous, slightly rimose, somewhat pulverulent; lirellæ* black, *very variable in size and shape, numerous and crowded*, round, oblong, lineari-oblong and lineari-elongate, simple, *acuminate; epithecium broad, plane; proper margin thin, elevated, prominent, flexuose;* spores 8, colourless, acicular, 6-9-septate; paraphyses few, slender, distinct; spermatia shortly cylindrical, slightly curved, different from *O. vulgata.*

On Scotch fir, rare. 1866.

SYN :—Nyl. in Flora 1866. p. 374. Leight. in Ann. and Mag. N. Hist. June 1867. *O. dubia*, Leight. Exs. 312.
EXS :—Leight. 381. 312.
GEOG. DISTRIB :—Europe.
BOT PROV :—1...7.
ENGLAND :—Selant Wood! near Hayle, Penzance. *Mr. Curnow.*
WALES :—Side of the Bala turnpike road, about ¾ mile from Dolgelley! (July 1866).
Spores .029 mm. long, .004 mm. broad.

26. *O. prosodea*, Ach. *dirty-pallido-fuscescent*, cartilagineo-membranaceous, effuse; *lirellæ sessile, thick, sub-cylindrical, somewhat shining*, straight; *epithecium rimæform; proper margin connivent, elevated, subcarinate;* spores colourless, elongato-fusiform, 11-13 septate; paraphyses distinct, stout; perithecium carbonaceous, thick, entire.

On oaks and beech, rare.

SYN :—Ach. Meth. 22. (1803.) Syn. 74. Nyl. Addit. N. Gran. 568.
EXS :—Spruce L. Amaz. 67. Larbal. 92.
GEOG. DISTRIB :—Amazons, Brazils.
BOT. PROV :—3...31.
ENGLAND :—Shiere! Surrey. *Dr. Capron.*
CHANNEL ISLANDS :—Ann Port; St. Peter's Valley, Fliquet Bay; Belcroute Bay, Jersey! *Mr. Larbalestier.*
"Spores .045—.057 mm. long, .006—7 mm. broad." *(Nyl.)* Spores .056 mm. long, .006 mm. broad.

27. *O. viridis*, Pers. *pale-dusky-yellow*, thin, sub-tartareous, rimose, limitate; *lirellæ small, innate, rounded, oblong, or linear*, straight or curved, chiefly simple; epithecium rimæform, uniform; proper margin rounded. inflexed; *spores* 8, colourless, *elongato-fusiformi-acicular*, 13-*septate.*

On trees, beech, holly, rare.

SYN : -Pers. in Ach. Meth. 22. (1803.) Nyl. Scand. 256. *O. siderella*, Leight. Br. Graph. 24. Mudd Man. 233.
FIG :—Leight. Br. Graph. t. 6. f. 14.
EXS :—M. & N. 648. Schær. 96. Hepp 164.
GEOG. DISTRIB :—France, Germany, Sweden, Ceylon.
BOT. PROV :—1, 2, 3...7...10...19...31.
ENGLAND :—New Forest! Hants. *Mr. Lyell.* Hoggarts Wood; Ingleby

Park, Cleveland. *Mr. Mudd.* Dunsford, Exeter. *Mr. Parfitt.* Eynsford, Brastead, Otford, Maidstone, Beechborough, Kent. *Mr. Holmes.*

IRELAND :—Castlebernard Park, Bandon. *Adm. Jones.* Castlemartyr ; Turk, Dinis, and Cromaglown, Killarney ; Eagle's Nest. *Mr. Carroll.*

WALES :—Trefriw ! N. Wales.

CHANNEL ISLANDS :—St. Peter's Valley, Jersey. *Mr. Larbalestier.*

"Spores .009 to .011 in. long, by .001 in. broad. t. 4. f. 90." (*Mudd.*) "Spores .035—55 mm. long, .007—9 mm. broad." (*Nyl.*) .049 mm. long, .005 mm. broad.

forma *taxicola*, Leight. *pale-yellowish-grey, pulverulent, effuse ; lirellæ large, excessively prominent and sessile, oblongo-linear or lineari-elongate*, straight or curved, chiefly simple, *scattered or congregated ; epithecium broadly rimæform ;* proper margin rounded, inflexed, rugged ; spores 8, colourless, elongato-fusiformi-acicular, 13-septate.

On yew, rare. 1853.

SYN :—Leight. Br. Graph. 25. Mudd Man. 234.

FIG :—Leight. Br. Graph. t. 6. f. 15.

GEOG. DISTRIB :—Europe.

BOT. PROV :—2...7, 8...31.

ENGLAND :—Funtington church yard ! ; Hunston church yard ! Aldingbourne church yard ! Sussex. *Mr. Borrer.* (1853.) Twycross, Leicestershire. *Rev. A. Bloxam.* Church yard, Hayling Island, Hants. *Mr. Larbalestier.*

WALES :—Llanrhochwyn church yard !

CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*

Spores .049 mm. long, .004 mm. broad.

28. *O. involuta* (Wallr.) *viridi-fuscescent*, thin, continuous ; *lirellæ black*, opake, *abbreviated, emerged, irregularly lirellæform, or rotundato-difformed ;* epithecium more or less applanate ; *margins thickish, involute ;* spores 4-6, colourless, fusiform, multiseptate.

On holly, rare. 1874.

SYN :—*Graphis*, Wallr. Fl. Germ. Crypt. p. 329. (1831.) *Zwackia*, Körb. Syst. p. 286. *Opegrapha*, Nyl. Prodr. 154.

GEOG. DISTRIB :—Germany, France.

BOT. PROV :—1...7.

ENGLAND :—Ivy Bridge ! Devon. *Mr. Holmes.*

WALES :—Trefriw ! (1874.)

## VI. PLATYGRAPHA, *Nyl.*

Thallus thin or obsolete. Apothecia black, plane, simple, immarginate or surrounded with a shining thalline margin. Spores 8, colourless, fusiform, septate. Spermatia shortly cylindrical, straight or slightly curved.

1. *Pl. rimata*, (Fw.) *white, tartareous*, thin, rimose, *verruculose ; apothecia lirellæform, fuscous-black, impressed in the verrucæ*, simple or branched, straight or wavy, either acute at the extremities or obtuse or rounded, broad and expanded, plano-convex, shining, *surrounded with a spurious narrow whitish thalline margin ;* hypothecium nigro-fuscous, thick ; paraphyses distinct ; spores 8, colourless, aciculari-fusiform, curved, 3-septate.

On ash and wych-elm, rare.

SYN :—Flot. L. Exs. 438. B. (1829.) Nyl. Prodr. 162. Mudd Man. 244. *Chiodecton graphidioides*, Leight. Br. Graph. 51.

FIG :—Leight. Br. Graph. t. 7. f. 29.

EXS :—Welw. Lusit. 89. (in part).

GEOG. DISTRIB :—France, Portugal, N. Granada, Canaries.
BOT. PROV :—5...7...23.
ENGLAND :—Near Sharpstones Hill ! Shropshire.
IRELAND :—Loughlinstown ! *Herb. Borrer.*
WALES :—Chirk Castle Park ! Denbighshire.
"Spores .007 in. long, by .0005 to .00075 in. broad. t. 4. f. 95." (*Mudd.*) "Spores .024—34 mm. long, .003—4 mm. broad." (*Nyl.*) Spores .024—.034 mm. long, .003—.0035 mm. broad.

## VII. STIGMATIDIUM, *Mey.*

Thallus distinct, crustaceous, thick. Apothecia punctiform or elongated, slender, aggregate or single, immersed, internally entirely whitish ; hypothecium colourless. Spores elongato-fusiform. Spermatia straight, shortish.

1. *St. crassum*, Dub. *greyish-white, olive or brownish-olive*, determinate, *decussate* with blackish lines, crustaceous, *thickish and turgid*, smooth and polished, contiguous or rimulose ; *apothecia brownish-black*, numerous, *very minute, punctiform*, slightly convex, immarginate, *solitary or confluent in flexuose radiate lines, deeply immersed ; spores* 8, colourless, fusiform, 5-septate.

On trees, ash, holly, oak, not uncommon. 1807.

SYN :—Duby Bot. Gall. p. 643. (1830.) Nyl. Prodr. 163. Mudd Man. 243. *Sagedia aggregata*, Leight. Ang. Lich. p. 24.
FIG :—E. Bot. 1752. Leight. Ang. Lich. t. 8. f. 1.
EXS :—M. & N. 955. Schær. 587. Leight. 69. Mudd 224. Bohl. 116. Larbal. 45. 46. Welw. Lusit. 89. (in part).
GEOG. DISTRIB :—France, Germany, Algeria.
BOT. PROV :—1, 2, 3. 4, 5, 6, 7, 8, 9, 10...(19...26...30)...31.
ENGLAND :—New Forest, Hants. *Mr. Lyell.* (1807.) Sussex. *Mr. Borrer.* Bery Castle ! Totness, Devon. *Dr. Deakin.* Westerdale ! Newton Wood ! Cleveland. *Mr. Mudd.* near Thirsk, Yorkshire. *Mr. Baker.* near Exeter, Devon. *Mr. Parfitt.* New Forest and Epping Forest. *Rev. J. M. Crombie.* near Malvern. Worcester ; S. Devon and Cornwall. *Dr. Holl.* Stoke Wood, Exeter. *Mr. Parfitt.* near Twycross, Leicestershire. *Rev. A. Bloxam.* Plymouth. *Mr. Holmes.* Great Glenham, Suffolk. *Rev. E. N. Bloomfield.* Wrotham, Ightham, Canterbury, Kent. *Mr. Holmes.* Parkgate ! Cheshire. Sharpstones ! Shropshire.
IRELAND :—On old trees, common. *Mr. Carroll.* Lough Inagh ! *Mr. Larbalestier.*
WALES :—Cherriton Church-yard ! Pembrokeshire. *Rev. T. Salwey.* Gloddaeth ! near Conway. Llanbedrog ! Fishguard !
CHANNEL ISLANDS :—Ann Port ! Jersey. (saxicole) Rozel ! and La Coupe ! and all the Islands. *Mr. Larbalestier.*
"Spores .006 to .008 in. long, by .001 in. broad." (*Mudd.*) Spores .031—.032 mm. long, .005 mm. broad.

2. *St. circumscriptum*, (Tayl.) *glaucous-white, thick, tartareous*, sub-determinate or effuse, even, *sub-pulverulent, rimulose ; apothecia brownish-black*, very minute, *punctiform, innate, obovate or clavate, crowded* and congregated, solitary, *distinct or lineari-confluent*, plane or slightly convex, pruinose or naked, immarginate, internally pale ; *spores* 8, *fuscous, narrowly obovate or clavate*, 5-*septate*.

On shaded rocks, very rare. 1836.

SYN :—*Verrucaria*, Tayl. Fl. Hib. 2. 96. (1836.) *Sagedia*, Leight. Angioc. Lich. 24. Mudd Man. 253.
FIG :—Leight. Ang. Lich. t. 8. f. 3.
EXS :—Mudd 239.
GEOG. DISTRIB :—France.
BOT. PROV :—1...10...19...30, 31.

ENGLAND :—Airyholme Wood, Cleveland. *Mr. Mudd.* Mouth of Tamar, Devonport! East Lyn, Kent. *Mr. Holmes.*

IRELAND :—Kerry! *Dr. Taylor.* co. Antrim. *Dr. Moore.*

CHANNEL ISLANDS :—La Coupe; Rozel Valley! Jersey. *Mr. Larbalestier.*

"Spores .005 in. long, by .0015 in. broad at apex and by .00075 in. at base, t. 4. f. 100." (*Mudd.*) Spores .02—.025 mm. long, .005 mm. broad.

3. *St. dendriticum*, Leight. *whitish or cream-coloured*, thin, tartareous, *smooth*, effuse, (K yellow C yellow); *apothecia lirellæ-form, black, innate*, irregularly and variously *branched in a dendritic or radiate manner*, plane, naked, immarginate, internally pale; *spores* 8, *colourless, narrowly obovate or clavate*, 3 *or* 4-*septate, upper cell larger.*

On micaceo-schistose rocks, rare. 1875.

SYN :—Leighton in Journ. Bot. Sept. 1875.

FIG :—Journ. Bot. l. c. tab. 166.

BOT. PROV :—26.

IRELAND :—Near Rinvyle! and on the Doughruagh Mountain (alt. 1800 ft.) Kylemore! Salrock! co. Galway. Maam! Joyce country. *Mr. Larbalestier.* (1875.)

Thallus sometimes slightly rimulose, consisting internally of innumerable colourless very minute, rounded granular bodies amid which are round or oblong nucleolate gonidia. Paraphyses flocculose, closely packed and entangled. The septa confined to the lower portion of the spore. Medulla white I yellowish. Gelatina hymenea I—. Analagous to *St. circumscriptum* (Tayl.) just as *St. venosum* (Ach.) is to *St. crassum*, Dub. Spores .019—.022 mm. long, .006—.007 mm. broad.

4. *St. Hutchinsiæ*, Leight. *dull-pale-yellow*, thin, crustaceous, nigro-limitate, *continuous, minutely rimulose; apothecia lirellæform, dark-brown, each innate in an elevated thalline verruca which forms a spurious narrow paler margin*, variable, round and minute, oblong, linear, more or less branched, straight or curved and flexuose, plane, dilated, immarginate; excipulum lateral, brown; spores 8, colourless, fusiform, 5-7-or pluri-septate.

On shaded rocks, not common. 1853.

SYN :—Nyl. Enum. 132. (1858.) Mudd Man. 243. *Platygramma Hutchinsiæ*, Leight. Br. Graph. 49. (1854.)

FIG :—Leight. Br. Graph. t. 7. f. 28.

EXS :—Leight. 130. Mudd 225. 226. Zw. 392. B. Arn. 293.

GEOG. DISTRIB :—Europe, Germany.

BOT. PROV :—1...7...10...12...19...26...31.

ENGLAND :—Keswick! Cumberland. *Herb. Borrer.* Newton rocks; Pinchingthorp Wood! Airyholme Wood; Beech Bank, Kildale! Cleveland. *Mr. Mudd.* Whitesand, Cornwall. *Rev. J. M. Crombie.* near Derwentwater! *Mrs. Stanger.* Ayton! Yorkshire. *Mr. Baker.* near St. German's, Cornwall. *Dr. Holl.* Plymouth. *Mr. Holmes.*

IRELAND :—Near Bantry! *Miss Hutchins.* Carig Mountain, Kerry. *Dr. Taylor.* Blackwater Bridge, Kerry. *Adm. Jones.* Dunscombe's Wood, Cork; Dinis Island (and also f. corticole), Muckruss Demesne; Island in Upper Lake, Killarney. *Mr. Carroll.* Dawros River! co. Galway. *Mr. Larbalestier.*

WALES :—Edderton Wood! Montgomeryshire; Bettws-y-coed! Conway falls! Moel-y-gest!

CHANNEL ISLANDS :—St. Peter's Valley; Gargate Mill Valley! Jersey. *Mr. Larbalestier.*

"Spores .006 to .007 in. long, by .001 in. broad, t. 4. f. 94." (*Mudd.*) "Spores .023—28 mm. long, .004—5 mm. broad." (*Nyl.*) Spores .025—.030 mm. long, .004 mm. broad.

5. *St. venosum*, (Ach.) *dirty-cream-colour*, tartareous, nigro-fusco-limitate, smooth, continuous, *in turgescent patches; apothecia lirellæform, dark-reddish-brown, innate*, slender, *variously branched.*

*lecanoræ*, *plane-convex*, diffracted, naked, immarginate, with a *pale spurious narrow thalline margin*, internally pale; spores 8, colourless, *elongate-cuneiform*, 13-septate.

On old trees, rare.

Syn:—Mudd Man. 236. (*Sporopodium*, Sm. E. Bot. 2654. (1837.) *Platygrapha dolosella*, (Lyell Mss. in herb. Borrer.) Leight. Br. Graph. 38.
Fig:—E. Bot. t. 2654. Leight. Br. Graph. t. 7. f. 37.
Geog. Distrib:—Europe.
Bot. Prov:—2...25.
England:—New Forest! Hants. *Mr. Lyell.* Quarr Abbey Wood! near Ryde, Isle of Wight. *Rev. A. Blomm.* near Brockenhurst in New Forest. *Br. J. M. Crombie.*
Ireland:—Glenstall co. Tipperary. *Mr. Carroll.*
"Spores .007 to .009 in. long, by .00075 in. broad." (*Mudd.*) Spores .018—.044 mm. long, .002 mm. broad.

## VIII. ARTHONIA, *Ach.*

Thallus thin or hypophlœodal and evanescent. Apothecia (*ardellæ*) roundish or difformed, plane or tumid, innately sessile, immarginate; thalamium sub-gelatinous, without paraphyses; asci pyriform thickened at the apices; spores 4-8, colourless, rarely brown, obovate, septate, upper cell larger. Spermatia cylindrical, straight or curved.

### * *Spores* 1-*septate.*

1. *A. lurida*, Ach. *pale-dirty-brown or lead-colour*, indeterminate, effuse, smooth, obsolete; *ardellæ reddish-black*, sessile, appressed, *irregularly roundish*, slightly convex, dull, internally concolorous; *spores* 8, colourless, *broadly-obovate*, 1-*septate*, *small*.

On trees, fir, holly, oak, not common. 1837.

Syn:—Ach. L. U. 143. (1810.) Syn. 7. Nyl. Scand. 258. Leight. Br. Graph. 57. Mudd Man. 250.
Fig:—E. Bot. Suppl. 2692. f. 2. Leight. Br. Graph. t. 8. f. 38.
Exs:—Scher. 17. Mudd 236. Zw. 86. M. & N. 1325. Th. M. Fries 47. Hepp 161. Leight. 17.
Geog. Distrib:—France, Switzerland, Germany, Russia, Scandinavia.
Bot. Prov:—2...5...7, 8...10...19...31.
England:—Black Down, Sussex! *Mr. Borrer.* (1837.) New Forest! Hants. *Mr. Lyell.* Orton Wood! Leicestershire. *Rev. A. Blomm.* Airyholme Wood! Cliffrigg! Newton Wood! Cleveland. *Mr. Mudd.* Leigh Woods, Clifton. *Mr. Larbalestier.* Chedworth Woods, Gloucestershire. *Mr Joshua.* Pontesbury! Bomere Pool! Sharpstones! Shropshire.
Ireland:—Killarney. *Sir T. Gage.* Ardtully co. Kerry. *Dr. Taylor.*
Wales:—Gwydir Woods! Bettws-y-coed. Trefriw! Edderton! Montgomeryshire.
Channel Islands:—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .0015 to .00175 in. long, by .0005 to .00075 in. broad." (*Mudd.*) "Spores .011—15 mm. long, .004—5 mm. broad. Gelatina hymenea I vinosa-red." (*Nyl.*) Spores .009—.015 mm. long, .004—.006 mm. broad.

2. *A. vinosa*, Leight. *bright-pale-brown*, thin, membranaceous, smooth, sub-determinate; *ardellæ deep-vinous-red*, *minute*, *irregularly roundish*, variable in size, single or confluent, sessile, convex, dull, internally concolorous; *spores* 8, colourless, obovate, 1-septate, *double the size of those of A. lurida.*

On oak.

SYN :—Leight. in Ann. and Mag. N. Hist. Oct. 1856. Mudd Man. 250.
FIG :—Leight. l. c. t. 11. f. 6. 7. 8. 9. 10.
EXS :—Leight. 224. Mudd 235.
GEOG. DISTRIB :—France.
BOT. PROV :—2, 3...5, 6, 7...10...19.
ENGLAND:—Newton Wood ! Stogdale ! Oggeray Gill ! Cleveland. *Mr. Mudd.* (1856.) Hickmore Fen Wood ; Pod's Wood, Messing, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* Nesscliffe Hill ! Shropshire.
IRELAND :—Castlebernard ! *Mr. Carroll.*
WALES :—Gwydir Woods ! Bettws-y-coed. Trefriw ! Beddgelert ! Knighton ! Radnorshire.
"Spores .003 in. long, by .001 in. broad." *(Mudd.)* Spores .014—.015 mm. long, .004—.005 mm. broad.

Var. *pineti*, Körb. *glauco-rufescent*, very slightly leprose, unequal ; *ardellæ reddish-black* or black, *minute*, crowded, *difformed, angular or sub-stellate*, plane ; *spores* 4-6, colourless, at length *fuscescent*, obovate, 1-septate, as in *vinosa*.

On trees, holly, in sub-alpine localities, rare

SYN :—Körb. S. L. G. 292. (1855.) Nyl. Scand. 261.
FIG :—Hepp Sporen t. 64. f. 558. Grevillea 1. t. 4. f. 5.
EXS :—Hepp 558. Arn. 243. Zw. 309.
GEOG. DISTRIB :—Germany, Scandinavia.
BOT. PROV :—6, 7...19...22...24, 25, 26.
IRELAND :—Glencar, Kerry ; Loughcooter, Galway ; Luggela co. Wicklow ; Eagle's Nest, Killarney ; co. Cork ; *Mr. Carroll.* Clonmel. *Mr. Wright.* Kylemore ! Doughruagh ! co. Galway. *Mr. Larbalestier.*
WALES :—Gwydir Woods ! Bettws-y-coed. Trefriw ! Beddgelert ! Builth ! Capel Arthog ! Dolgelley !
"Spores .016—20 mm. long, .007—8 mm. broad. Gelatina hymenea I vinous-red." (*Nyl.*) Spores .013—.0165 mm. long, .006—.007 mm. broad. This Arthonia may be readily distinguished from its congeners by a section of the ardella turning vinous-red or purple in K.

3. *A. atrofuscella*, Nyl. "Similar to *A. pineti*, Krb. but with smaller spores. Spores .012—16 mm. long, .005—6 mm. broad." *(Nyl.)* Spores .015 mm. long, .007 mm. broad. K renders hymenium dusky atro-fuscescent.

On trees.

SYN :—Nyl. in Flora 1875. p. 363.
BOT. PROV :—26.
IRELAND :—Doughruagh Mountain ! Kylemore ! Galway. *Mr. Larbalestier.* (1876.)

4. *A. aspersella*, Leight. *pale-yellowish*, maculari-effuse ; *ardellæ black or nigro-fuscus, very minute*, scattered, *punctiform, linear or angulari-confluent ;* hymenium untinged by K ; spores 8, colourless, obovate, 1-septate.

On holly. 1872.

SYN :—Leight. in Grevillea 1. 60. (1872.)
FIG :—Grevillea l. c. t. 4. f. 4. a. and b.
BOT. PROV :—7.
WALES :—Gwydir Woods, Bettws-y-coed ! (1872.) Trefriw ! Capel Arthog Dolgelley !
This lichen assimilates in general aspect with *A. vinosa var. pineti*, but in that the ardellæ are roundish and the hymenium is tinged red-purple with K ; whilst in *aspersella* the ardellæ are remarkable for a peculiar sharp angularity, and the hymenium is untinged by K. Spores .014 mm. long, .0055 mm. broad

5. *A. sapineti*, Nyl. *virescent*, macular, effuse ; *ardellæ nigro-fuscous*, very minute, *punctiform or angulari-confluent ;* hymenium untinged by K ; spores 8, colourless, obovate, 1-septate.

On holly, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 239.
EXS :—Rabh. 575. (fide Nyl.)
GEOG. DISTRIB :—Europe.
BOT. PROV :—26.
IRELAND :—Killery Bay near the Levant Hotel, Connemara. *Mr. Larbalestier.* (1876.)
"Spores .011—14 mm. long, .006 mm. broad." (*Nyl.*) Spores .013—.015 mm. long, .005 mm. broad. Scarcely different, if at all, from *A. asperella*, Leight.

6. *A. patellulata*, Nyl. *whitish*, indeterminate ; *ardellæ black, rotundate, appressed*, plane, scattered, *immarginate*, internally nigricant ; *spores* 8, colourless, *obovate*, 1-septate, *small* ; hypothecium obscurate at the base.

On poplars, rare.

SYN :—Nyl. in Bot. Notis. 1853. p. 95. Nyl. Scand. 262. Crombie En. 105.
FIG :—Fellm. 209. 210. Stenh. 146.
GEOG. DISTRIB :—Sweden, Finland, Lapland.
BOT. PROV :—24...28.
IRELAND :—Armagh Demesne. *Adm. Jones.* Carrigogunnel ; Castleconnel near Limerick. *Mr. Carroll.*
"Spores .009—.013 mm. long, .003—5 mm. broad. Gelatina hymenea I vinous-red" (*Nyl.*) Spores .013 mm. long,. 005 mm. broad.

7. *A. melaspermella*, Nyl. *pallescent*, effuse or evanescent ; *ardellæ black or fuscous-black, rotundate, lecideiform*, plane, small, margined, *margin sub-crenulate*, at length evanescent ; spores 8, fusco-nigrescent, oblongo-ovoid, 1-septate.

On old wood, rare. 1866.

SYN :—Nyl. in Flora 1855. Crombie En. 105.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2.
ENGLAND :—Near London ! *Mr. Currey.* (1866.) Oakley Park, Cirencester ; Braydon Pool, Gloucestershire. *Mr. Joshua.* Bomere Pool, Shropshire. *Mr. W. Phillips.*
This plant is, in the opinion of Mr. Currey and Mr. W. Phillips, identical with *Patellaria lignyota*, Fr.

8. *A. excipienda*, Nyl. *cinerascent*, whitish, determinate ; *ardellæ slender, oblong* punctiform or *flexuoso-irregular*, plane ; spores 8, colourless, minute, obovate, 1-septate.

On trees, hazel, very rare. 1867.

SYN :—Nyl. Scand. 261. Crombie En. 104.
GEOG. DISTRIB :—Aland, Finland.
BOT. PROV :—19.
IRELAND :—Base of Mangerton ! (1867.) Turk, Mangerton, Killarney. *Mr. Carroll.*
"Spores .011—17 mm. long, .006—.0065 mm. broad. Gelatina hymenea I vinous-red." (*Nyl.*)

9. *A. lapidicola*, (Tayl.) *fusco-olivaceous*, thin, *furfuraceous* ; *apothecia black, rotundate or rotundato-difformed*, appressed, plane, immarginate, internally nigricant ; spores 6-8, colourless, obovate 1-septate.

On calcareous rocks and stones, rare. 1836.

SYN :—*Lecidea lapidicola*, Tayl. Fl. Hib. 2. 124. (1836.) *Arthonia ruderalis*, Nyl. Scand. 262. *Arthonia fusca*, Mass. Ric. 80.
FIG :—Hepp Sporen t. 62. f. 534.
EXS :—Leight. 398. Hepp 534. Anzi Venet. 86.

GEOG. DISTRIB :—Bavaria, Italy, Sweden.
BOT. PROV :—2...5, 6, 7...15...19...30.
ENGLAND :—Fairlight near Hastings ! Hale's End, Malvern ! *Dr. Holl.*
SCOTLAND :—Ben Lawers. *Adm. Jones.*
IRELAND :—Co. Down. *Mr. Templeton.* Cappamore ! near Dunkerron, co. Kerry. *Dr. Taylor.*
WALES :—Pandy near Abergavenny, co. Monmouth. *Dr. Holl.* Dolgelley !
"Spores .015—17 mm. long, .007 mm. broad." *(Nyl.)*

10. *A. spadicea*, Leight. *pale-red-brown*, obsolete, smooth, shining ; indeterminate ; *ardellæ dull-brownish-black*, flat or tumid, smooth, sessile, variable in size, *larger ones roundish or oblong, smaller round and punctiform ; spores* 8, colourless, *slenderly clavæform*, or lineari-obovate, small, 1-*septate, cells nucleolate, the lower cell* frequently elongated and *containing two round nucleoli*, which give the spore the appearance of being 2-septate or 3-locular.

On hazel, hawthorn, holly, &c., rare. 1852.

SYN :—Leight. Br. Graph. 57. (1854.) Mudd Man. 251.
FIG :—Leight. Br. Graph. 57. t. 8. f. 39.
EXS :—Leight. 97. Nyl. 86.
GEOG. DISTRIB :—France.
BOT. PROV :—1...5...7, 8...10...19...26...31.
ENGLAND :—Gopsall ! Leicestershire. *Rev. A. Bloxam.* Yorkshire ! *Mr. Dixon.* Newton Wood ! Cleveland. *Mr. Mudd.* Leigh Woods, Clifton. *Mr. Larbalestier.* Stoke Wood, Exeter. *Mr. Parfitt.* Chedworth Wood. *Mr. Joshua.* Shelton Rough ! near Shrewsbury, Shropshire. (1852.)
IRELAND :—Ballyedmond and Glenbower Woods, co. Cork. *Mr. Carroll.* Lord Sligo's demesne, Westport, co. Mayo. *Mr. Larbalestier.*
WALES :—Trefriw !
CHANNEL ISLANDS :—Rozel, Jersey. *Mr Larbalestier.*
"Spores .002 in. long, by .00075 in. broad." (*Mudd.*) Spores .011—.012 mm. long, .004—.005 mm. broad.

11. *A. proximella*, Nyl. *silvery-grey*, effuse, hypophlæodal ; *ardellæ nigro-fuscous* or *black, minute, round, lecideoid*, opake, *plane, internally nigrescent ;* spores 8, fuscous, obovate, 1 septate.

On holly and oak, rare. 1872.

SYN :—Nyl. Scand. 262. (1861.) Leight. in Grevillea 1. 60.
FIG :—Grevillea t. 4. f. 3. a. b. c.
EXS :—Fellm. 208.
GEOG. DISTRIB :—Lapland.
BOT. PROV :—2, 3...5...7.
ENGLAND :—Woolwich Wood, near Sibertswold, Dover, Kent. *Mr. Holmes.* Harley Wood, Cirencester ; Braydon Forest, Wilts ; Sandrocks, Ardingley, Sussex. *Mr. Joshua.* Raglith ! near Church Stretton. Castle Hill Plantation ! near Acton Scott. Shropshire.
WALES :—Gwydir Woods, Bettws-y-coed ! (1872.) Tremadoc !
"Spores .016—20 mm. long, .008—.010 mm. broad." (*Nyl.*) Spores .019—.020 mm. long, .008 mm. broad.

12. *A. punctilliformis*, Leight. thallus a mere film ; *ardellæ nigro-fuscous, excessively minute*, not larger than a pin's point, irregularly roundish, convex, scattered, internally brown ; asci pyriform, paraphyses none ; *spores* 8, *pale-fuscescent, oblongo-clavate*, 1-*septate, large.*

On holly, very rare. 1874.

SYN :—Leight. in Linn. Trans. 2d. ser. 1. 146. (1876.)
FIG :—Linn. Trans. l. c. t. 22. f. 26. 27. 28.
BOT. PROV :—7.

WALES :—Trefriw ! (1874.)
Spores .029 mm. long, .0135 mm. broad.

13. *A. Hibernica*, Nyl. "probably a sub-species of *A. excipienda*, Nyl, from which it chiefly and constantly differs in the larger spores" (*Nyl.*)

On smooth bark, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 237.
BOT. PROV :—26.
IRELAND :—Killeray Bay ! Connemara. *Mr. Larbalestier.* (1876.)
"Spores .016—21 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .019—.020 mm. long, .007—.009 mm. broad.

** *Spores 3-septate.*

14. *A. ochracea*, (Duf.) *pallescent*, very thin ; *ardellæ darkly-ochraceous, depressed, lobato-difformed or substellate ;* spores 8, colourless, obovate, 3-septate.

On trees, rare. 1864.

SYN :—Dufour in Journ. Phys. 87. p. 205. (1818.) Nyl. Prodr. 164.
FIG :—Mass. Ric. fig. 83.
EXS :—M. & N. 470. Zw. 308. Mass. 14. Anzi 317.
GEOG. DISTRIB :—France, Switzerland, Italy, Germany.
BOT. PROV :—7...19.
IRELAND :—Glencar, Kerry. *Mr. Carroll.* (1864.)
WALES :—Trefriw !
"Spores .012 mm. long, .006 mm. broad." (*Nyl.*) Spores .017 mm. long, .006 mm. broad.

15. *A. Cascarillæ*, (Fée.) *pallido-glaucescent*, very thin ; *ardellæ blackish or fuscous-black, minute, simple, oblong or lineari-oblong or irregularly difformed* by confluence, plane ; spores 8, colourless, obovate, 3-septate.

On trees, rare. 1864.

SYN :—*Coniocarpon*, Fée Ess. 99. (1824.) Suppl. 94.
FIG :—Fée Ess. t. 7. f. 4. & 4. a. Suppl. t. 42. f. 3.
GEOG. DISTRIB :—Central America.
BOT. PROV :—6...19—26.
IRELAND :—Glencar ! Kerry. *Mr. Carroll.* (1864.) Kylemore ! co. Galway. *Mr. Larbalestier.*
WALES :—Knighton ! Radnorshire.
The specimens I have seen do not resemble Fée's figures of the plant itself, nor of the spores which he figures as having 4-5 septa, and describes as with "*quatre cloisons.*" The spores in the Irish plant were obovate, 3-septate, in size and form precisely as in *A. ochracea*, Duf. The Irish specimens were so named by Nylander. Spores .018 mm. long, .006 mm. broad.

16. *A. myriocarpella*, Nyl. *pale-ashy-grey*, thin, opake, *sub-areolate, sub-pulverulent*, effuse or evanescent ; *ardellæ fuscous-black or black, rotundate, lecideiform*, superficial, minute, plane or convex, immarginate, internally nigricant ; *spores* 8, colourless, oblongo-ovoid, 3-*septate*.

On micaceo-schistose rocks, rare.

SYN :—Nyl. N. Gran. 2. 107. (1864.) Crombie En. 104.
GEOG. DISTRIB :—N. Granada.
BOT. PROV :—15.
SCOTLAND :—Aviemore in Strathspey. *Adm. Jones.*
"Spores .010—12 mm. long, .0030—35 mm. broad." (*Nyl.*)

17. *A. aspersa*, Leight. *pale-opake, greyish-green*, thin, membranaceous, smooth, indeterminate ; *ardellæ dull-black*, minute,

*copiously sprinkled*, sessile, various in form, punctiform, roundish, oblong, ovate, angular or irregular, depressed or convex, internally fuscous; *spores* 8, colourless, *obovate*, 3-septate, small, *upper cell largest, occupying nearly half of the spore, the septa in the lower portion.*

On holly, rare. 1854.

SYN :—Leighton in Ann. and Mag. Nat. Hist. Oct. 1856. Mudd Man. 248.
FIG :—Ann. & Mag. Nat. Hist. 1856. t. 11. f. 11. 12. 13. 14. 15.
EXS :—Leight. 248.
GEOG. DISTRIB :—Normandy.
BOT. PROV :—5...7...10...13.
ENGLAND :—Farndale; Baysdale! Hobhole! Cleveland. *Mr. Mudd.* (1854.) Lyd Hole! Pontesford, Shropshire.
IRELAND:—Cromaglown Mountain, Killarney. *Mr. Carroll.*
WALES :—Trefriw!
"Spores .003 in. long, by .001 in. broad, t. 4. f. 97." (*Mudd.*) Spores .012—.014 mm. long. .004—.0045 mm. broad.

18. *A. punctiformis*, Ach. *copper-coloured*, thin, membranaceous, smooth, shining, indeterminate; *ardellæ dark-brown*, plane or slightly convex, rough, *sub-innate, scattered, roundish or broadly oblong*, simple, *internally pale*; *spores* 8, colourless, *lineari-clavate*, or obovate, *obtusely pointed*, 3-septate.

On trees, oak, hazel, thorn, rare.

SYN :—Ach. L. U. 141. (1811.) Syn. 4. Leight. Br. Graph. 53. Mudd Man. 247.
FIG :—Leight. Br. Graph. t. 7. f. 31.
EXS :—Mudd 231. Anzi Ven. 90. 91. Anzi Langob. 265. Rabh. 942.
GEOG. DISTRIB :—Scandinavia, Italy, Hungary.
BOT. PROV :—1, 2, 3...10...19...31.
ENGLAND :—Sussex! *Mr. Borrer.* Hoggarts Wood! Ingleby; Baysdale! Cleveland. *Mr. Mudd.* Torquay! Devon. *Dr. Deakin.* Braxted; Kelvedon, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.*
IRELAND :—Lermount! near Cork. *Mr. Carroll.*
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .004 to .0045 in. long, by .0015 in. broad." (*Mudd.*) Spores .020—.022 mm. long, .007—.0075 mm. broad.

forma *galactina*, Ach. thallus pale-yellow or cream-colour.

On young oaks, rare.

SYN :—Ach. L. U. 141. Syn. 4. Leight. Br. Graph. 53.
FIG :—Leight. Br. Graph. t. 7. f. 31.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...4...19...31.
ENGLAND :—Sussex! *Mr. Borrer.* Torquay! Devon. *Dr. Deakin.* Comberton Wood near Cambridge. *Mr. Larbalestier.* New Forest. *Rev. J. M. Crombie.*
IRELAND :—Dunscombe's Wood! Cork. *Mr. Carroll.*
CHANNEL ISLANDS :—St. John's, Jersey. *Mr. Larbalestier.*

Var. *melantera*, Ach. *fusco-nigricant* or copper-coloured; ardellæ immersed, oblong, elongate and difformed, somewhat concave.

On trees, rare. 1867.

SYN :—*Arthonia obscura var. melantera*, Ach. Syn. 7. (1817.)
GEOG. DISTRIB :—Sweden.
BOT. PROV :—31.
CHANNEL ISLANDS :—Noirmont Manor, Jersey! *Mr. Larbalestier.* (1867.)
Spores .017 mm. long, .005 mm. broad.

19. *A. astroidea*, Ach. *white, cream-colour or olive*, thin, membranaceous, smooth, scaly, *determinate; ardellæ blackish or*

*dark-brown*, plane, rough, *innate, clustered, substellate or radiate, internally pale ; spores* 8, colourless, *lineari-clavate*, roundish at the extremities, 3-septate.

On trees, sycamore, ash, mountain-ash, frequent.

SYN :—Ach. Meth. 25. (1803.) Syn. 6. Nyl. Scand. 259. Leight. Br. Graph. 53. Mudd Man. 246.

FIG :—E. Bot. 1847. Leight. Br. Graph. t. 8. f. 32.

EXS :—Leight. 289. Fries. 24. (fide Nyl.) Fellm. 207. Mudd 227. Schær. 16. Stenh. 149.

GEOG. DISTRIB :—Sweden, Lapland, Switzerland, France, Belgium, Italy, Portugal.

BOT. PROV :—1, 2, 3...5, 6, 7...10, 11...15...19...26...31.

ENGLAND :—Sussex ! *Mr. Borrer.* Berwick-on-Tweed. *Dr. G. Johnston.* Cliff rigg ! Cleveland. *Mr. Mudd.* Haldon, Exeter. *Mr. Parfitt.* Braxted, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Cirencester Park. *Mr. W. Joshua.* Hailsham, Eastbourne. *Mr. Roper.* Ightham, Kent. *Mr. Holmes.* Haughmond Hill ! Bomere Pool ! near Shrewsbury, Shropshire. Dinmore Wood ! Herefordshire.

SCOTLAND :—Woods opposite Birnam, Dunkeld ! Glen Shee ! Perthshire ; Glen Nevis ! Invernesshire ; Kinnoull Hill ! Perth. *Dr. Lindsay.*

IRELAND :—Cromaglown ! Killarney. *Mr. Carroll.* Lough Muck ! co. Galway. *Mr. Larbalestier.*

WALES :—Bettws-y-coed Churchyard ! Wood opposite Tanybwlch Hotel, Capel Curig ! Craig Breidden ! Builth ! Capel Arthog ! Chirk Castle Park ! Edderton !

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

"Spores .003 to .004 in. long, by .001 to .0015 in. broad." (*Mudd.*) "Spores .015—18 mm. long, .005—7 mm. broad." (*Nyl.*) Spores .018—.009 mm. long, .005 mm. broad.

var. *simulans*, Leight. ardellæ brown, scattered, innate, *not distinctly stellate* or radiate, *appearing as if rubbed down*, and resembling those of *A. aspersa*, but differing in spores.

On ash. Castle Hill Plantation ! near Acton Scott, Shropshire. (1875.)

20. *A. epipasta*, (Ach.) *grey or copper-coloured*, thin, membranaceous, smooth, shining, irregularly circumscribed ; *ardellæ dark-brown*, plane, roughish, *innate, scattered, oblong or elongato-oblong, simple or branched, internally pale ; spores* 8, colourless, lineari-clavate, 3-septate, *double the size of those of A. astroidea.*

On trees, oak, alder, beech, not common. 1807.

SYN :—*Opegrapha*, Ach. Meth. 26. (1803.) Syn. 75. Leighton Br. Graph. 51. Mudd Man. 247.

FIG :—E. Bot. 1911. Leighton Br. Graph. t. 7. f. 30.

EXS :—Mudd 230. M. & N. 359. Anzi Langob. 208. Rabh. 931.

GEOG. DISTRIB :—Germany, Hungary, Lombardy.

BOT. PROV :—2, 3, 4...7...10...26...31.

ENGLAND :—Thorpe near Norwich. *Sir J. E. Smith.* (1807.) Yarmouth. *Mr. Turner.* Sussex ! *Mr. Borrer.* Cliffrigg ! Hoggets Wood ! Ingleby, Cleveland. *Mr. Mudd.* Braxted, Essex. *Mr. Varenne.*

IRELAND :—Kylemore Castle ! co. Galway. *Mr. Larbalestier.*

WALES :—Festiniog road, Dolgelley ! Moel-y-Golfa ! Gwydir Woods ! Bettws-y-coed.

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

"Spores .003 in. long, by .001 in. broad." *(Mudd.)* Spores .028 mm. long, .009 mm. broad."

21. *A. Swartziana*, Ach. *pale-yellow, cream-colour or ashy-grey*, thin, cartilagineo-membranaceous, scaly, subdeterminate ; *ardellæ black*, plane, irregularly cracked, sub-sessile, *clustered into irregular*

*angular or sub-radiate shapes, internally brownish; spores* 8, colourless, *very broadly obovate*, 3-septate.

On trees, holly, mountain-ash, oak, poplar, ivy, alder, beech frequent. 1809.

SYN :—Ach. in Schrad. Journ. Bot. 1. 3. p. 13. (1806.) Syn. 5. Leight. Br. Graph. 54. Mudd Man. 246.
FIG :—E. Bot. 2079. Leight. Br. Graph. t. 8. f. 33.
EXS :—Schær. 462. Anzi It. S. 323. Mudd 228. Leight. 70.
GEOG. DISTRIB :—Switzerland, Hungary, Germany.
BOT. PROV :—1, 2. 3...5...7...10, 11...15...19...26.
ENGLAND :—Sussex! *Mr. Borrer.* (1809.) near the Retreat, Berwickshire! *Dr. G. Johnston.* Cliffrigg! Shuttershelf! Airyholme Wood! Cleveland. *Mr. Mudd.* Kings Kerswall, Newton, Devon. *Mr. Parfitt.* Tiptree; Feering; Beckingham, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Plymouth. *Mr. Holmes.* Montford Bridge! Nesscliffe Hill! Shropshire.
SCOTLAND :—Will's Braes, Forfarshire. *Mr. Gardiner.*
IRELAND :—Castlebernard Park! co. Cork. *Mr. Carroll.* Delphi, Connemara. *Mr. Larbalestier.*
WALES :—Moel-y-Golfa! Montgomeryshire. Festiniog road, Dolgelley Trefriw! Beddgelert! Tremadoc! Diganwy!
Spores .014—.0195 mm. long, .005—.007 mm. broad.

22. *A. trachylioides*, Nyl. *cream-colour, more or less tinged with rose*, rather thick, contiguous, smooth, subsequently *leproso-pulverulent*, effuse or sub-determinate; *ardellæ black*, small, very numerous, sessile, *rounded*, solitary, rarely confluent, plano-convex, immarginate, *nigro-pulverulent and rugose when old; spores* 6-8, colourless, obovate, or lineari-clavate, the extremities rounded, 3-*septate.*

On sub-alpine rocks, very rare. 1861.

SYN :—Nyl. Enum. Gen. 133. (1858.) Mudd Man. 251.
FIG :—Mudd Man. t. 4. f. 98.
EXS :—Mudd 237.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...7...10.
ENGLAND :—Farndale; Highcliffe; Ingleby Park; Yorkshire. *Mr. Mudd.* Chudleigh, Devon. *Mr. Parfitt.*
WALES :—Great Orme's Head! *Mr. Holmes.*
"Spores .003 to .0035 in. long, by .001 in. broad, t. 4. f. 98." (*Mudd.*)

23. *A. paralia*, Nyl. *fusco-cinerascent*, thin, *continuous*, smoothish, *rimose; ardellæ fuscous, rotundate*, nearly plane, *lecideoliform;* internally concolorous; hypothecium colourless; epithecium rufescent; spores 8, colourless, oviform or subconstricted in the middle, 3-4-septate.

On exposed maritime rocks, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 565.
BOT. PROV :—26.
IRELAND :—Cleghan near Kylemore. *Mr. Larbalestier.* (1877.)
"The thallus contains simple eugonidia. Gelatina hymenea and spores I vinous-red. Spores .018—22 mm. long, .007 mm. broad." (*Nyl.*)

*** *Spores* 4-*septate.*

24. *A. cinnabarina*, (Wallr.) *greyish*, filmy, thin, determinate; *ardellæ lurid and pruinose, or powdery and of a bright vermilion*, sessile, clustered, difformed, solid, plane, depressed; spores 8, pale-red, obovato-clavate, rounded at the extremities, 4-septate, upper cell largest.

On old trees, frequent.

SYN :—Wallr. Crypt. Germ. 320. (1831.) Nyl. Scand. 257. Leight. Br. Gra 58. Mudd Man. 249.

GEOG. DISTRIB :—Normandy, Germany, Italy, Portugal, Switzerland, Py nees, France, Ceylon, Calcutta, Amazons, S. America.

BOT. PROV :—1, 2, 3...5...10, 11...19...24...31.

"Spores .004 to .0055 in. long, by .002 in. broad." (*Mudd.*) "Spores .020 23 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .020—.023 mm. long, .007 008 mm. broad.

A very variable lichen of which the chief varieties and forms may be distr buted as follows :—

Var. *kermesina*, Nyl. *ardellæ* and thallus *vermilion-colour* Nyl. Scand. 257.

f. *cinnabarina*, T. & B. ardellæ somewhat convex, pulverulen vermilion-coloured. Leight. l. c. 59.

EXS :—Leight. 249. M. & N. 651. Schær. 239. Arn. 150. Welw. Lusit. 2 Anzi It. S. 318. Hepp 162.

FIG :—E. Bot. 2151. Leight. Br. Graph. t. 8. f. 40.

BOT. PROV :—1, 2, 3, 4, 5...10, 11...31.

ENGLAND :—Sussex ! *Mr. Borrer.* New Forest. *Rev. J. M. Crombie.* Air holme Wood ! Yorkshire. *Mr. Mudd.* Haldon, Exeter. *Mr. Parfitt.* Easthorp Rivenhall ; Woodham Walter, Essex. *Mr. Varenne.* Plymouth. *Mr. Holm* Great Glenham, Suffolk. *Rev. E. N. Bloomfield.*

SCOTLAND :—Pease Bridge ; Berwickshire. *Dr. G. Johnston.*

CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*

f. *rosacea*, T. & B. ardellæ collected into clusters, lobate, pulver lent, vermilion-coloured. Leight. l. c. 59.

ENGLAND :—Poyning's Common, Sussex. *Mr. Borrer.*

f. *marginata*, T. & B. ardellæ somewhat convex, parti-coloure chiefly powdery on the margins. Leight. l. c. 59.

EXS :—Leight. 250. Bohl. 53. Nyl. 146. Zw. 11. B. Körb. 289. Anzi Vene 87. Mudd 233.

ENGLAND :—Sussex ! *Mr. Borrer.* Ingleby Park ! near Ayton ! Yorkshir *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* Polegate, Eastbourne. *Mr. Rope* Abdon ! Shropshire.

IRELAND :—Dunscombe's Wood ! Cork. *Mr. Carroll.* Lough Derryclare ! c Galway. *Mr. Larbalestier.*

WALES :—Edderton ! Montgomeryshire.

Var. *pruinata*, Del. *ardellæ entirely albo-suffused.* Nyl. Scand 257.

f. *concolor*, T. & B. ardellæ convex, of the same colour with th thallus, albo-pruinose. Leight. l. c. 60.

EXS :—Leight. 251.

ENGLAND : —Sussex ! *Mr. Borrer.* New Forest, Hants. *Mr. Lyell.* nea Dorking. *Mr. Joshua.* Paradise, Eastbourne. *Mr. Roper.*

f. *dubia*, T. & B. ardellæ rather convex, lurid, dark-purple pruinose.

ENGLAND :—Sussex ! *Mr. Borrer.* Kelvedon, Essex. *Mr. Varenne.*

f. *microstigma*, T. & B. ardellæ minute, solitary, depressed, albo pruinose. Leight. l. c. 60.

ENGLAND :—Sussex ! *Mr. Borrer.*

IRELAND :—Glanmon ! Blarney ! Cork ; Ballynegarde co. Limerick. *Mr. Carroll.*

Var. *anerythrea*, Nyl. *ardellæ fuscous*, prominent, *naked, without* any vermilion powder.

ENGLAND :—Plymouth. *Mr. Holmes.* New Forest. *Rev. J. M. Crombie.* Hailsham, Eastbourne. *Mr. Roper.* Canterbury, Shoreham, Kent. *Mr. Holmes.*

f. *detrita*, T. & B. ardellæ depressed, lurid, dark-purplish, naked more or less stellate. Leight. l.c. 60.

EXS :—Schær. 649. Anzi Venet. 89. Arn. 363. Spruce Amaz. 347.
ENGLAND :—Sussex ! *Mr. Borrer.*
WALES :—Gwydir Woods ! Bettws-y-coed.

f. *astroidea*, Leight. ardellæ rather large, in depressed, naked, radiate or stellate clusters, sub-immersed or very slightly raised, dark-reddish-black or full-brown-black. Leight. l. c. 60.

EXS :—Mudd 234.
ENGLAND :—Ardingley, Michelgrove and Charlton Forest, Sussex ! *Mr. Borrer.* Airyholme ! Yorkshire. *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* Oakley Park, Cirencester. *Mr. Joshua.*
IRELAND :—Castlebernard ! O'Sullivan's Cascade ! Killarney. *Mr. Carroll.*

forma *cuspidans*, Nyl. distinguished from the type by the ardellæ being scarcely erythrinose, slenderer, the apices of the divisions acuminate.

On holly, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 310.
EXS :—Wright's Cuba 123. a. and b.
IRELAND :—Doughruagh Mountain. *Mr. Larbalestier.* (1876.)
Spores .016—19 mm. long, .006—7 mm. broad.

Var. *opegraphina*, Ach. *ardellæ depressed, linear*, simple or crowded, *substellato-difformed*, rough; spores 3-4-septate.

On trees.

SYN :—Ach. Syn. 6. (1817.) Crombie En. 103. Grevillea l. 59.
FIG :—Grevillea l. c. t. 4. f. 7.
GEOG. DISTRIB :—Sweden.
BOT. PROV :—7...19.
IRELAND :—Glenbower Wood ! co. Cork. *Mr. Carroll.*
WALES :—Gwydir Woods ! Bettws-y-coed.

Var. *epipastoides*, Nyl. *ardellæ minute*, irregularly flexuose, slender, *oblong*, or punctiform ; spores 3-4-septate.

On ivy, rare. 1869.

SYN :—Nyl. Scand. 259. (1861.) Crombie En. 103. Grevillea l. 59.
FIG :—Grevillea l. c. 1. t. 4. f. 8.
GEOG. DISTRIB :—France.
BOT. PROV :—19...26...31.
IRELAND :—Killarney. *Mr. Hardy.* Eagle's Nest ! Glenbower Wood ! Killeagh, co. Cork. *Mr. Carroll.* Kylemore Wood ! Connemara. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Noirmont Warren, Jersey ! *Mr. Larbalestier.*

25. *A. insinuata*, Strtn. *whitish* or pale, *subsquamulose*, very thin ; *ardellæ fuscous or fuscous-black, adnate*, round or oblong or somewhat irregular, *at first veiled*, generally *with a somewhat squamulose thalline margin*, internally pale ; spores 4-8, colourless, sometimes slightly fuscescent, oblong, crenulate at the margin, spuriously 4-septate or rather 5-celled, the cells equal in size ; gelatina hymenea I bright-blue.

On trees. 1875.

SYN —Stirton in Trans. Glasgow Soc. Nat. p. 90. (1875.)
BOT. PROV :—15.
SCOTLAND :—Near Killiecrankie. *Dr. Stirton.* (1875.)
Spores .014—.021 mm. long, .006—.008 mm. broad.

26. *A. pruinosa*, Ach. *whitish* or pale-yellow, thin, tartareous, cracked and uneven, *somewhat pulverulent*, indeterminate ; *ardellæ brownish or lead-coloured, rough, albo-pruinose, immersed*, roundish or irregularly oblong or difformed, plane or slightly convex, internally pale ; spores 8, colourless, lineari-obovate, rounded at the extremities, generally 4-septate, (sometimes 5, sometimes 3-septate.)

On old oaks, ivy, elm, yew and old timber, frequent. 1831.

SYN :—Ach. L. U. 147. (1810.) Syn. 7. Nyl. Scand. 258. *A. impolita*, Leight. Br. Graph. p. 55.
FIG :—E. Bot. Suppl. 2692. f, 1. Leight. Br. Graph. t. 8. f. 35.
EXS :—M. & N. 1159. Schær. 506. Leight. 131. Zw. 149. Nyl. 83. a. & b. Hepp 535. Anzi Etr. 51. Stenh. 147.
GEOG. DISTRIB :—Germany, Switzerland, France, Italy, Sweden, Normandy, N. America.
BOT. PROV :—1, 2, 3, 4, 5...7, 8...10, 11...19...24...31.
ENGLAND :—Kelvedon, Essex. *Mr. Varenne.* Plymouth. *Mr. Holmes.* Henfield, Sussex ! Kenilworth Castle ! Warwickshire ; Livermore ! Suffolk. *Mr. Borrer.* (1831.) Midland Counties. *Mr. Purton.* Cambridgeshire. *Rev. R. Relham.* Ingleby ! *Mr. Mudd.* Oswestry ! Shropshire. *Rev. T. Salwey.* New Forest. *Rev. J. M. Crombie.* Teesdale, Durham. *Mr. Winch.* Twycross Churchyard, Leicestershire. *Rev. A. Bloxam.* Old Eastbourne. *Mr. Roper.* Devonshire. *Messrs. Jones & Kingston.* Brampton Brian Park ! Herefordshire. High Rock ! near Bridgnorth ; Udlington ! Batchcot ! Hey Forest ! near Ludlow ; Ludlow Castle ! Shropshire.
IRELAND :—Cledaneanure, Kerry. *Dr. Taylor.* Adare Abbey near Limerick. *Mr. Carroll.*
WALES :—Bettws-y-coed Churchyard ! Gwydir !
CHANNEL ISLANDS :—St. Ouen's, Jersey. *Mr. Larbalestier.*
"Spores .003 to .00325 in. long, by .001 in. broad." (*Mudd.*) "Spores .013—17 mm. long, .005—7 mm. broad." *(Nyl.)* Spores .016 mm. long, .005 mm. broad.

27. *A. astroidestera*, Nyl. nearly similar to *A. astroidea*, but having the *apothecia more distinctly astroid*, brownish ; spores 3-5-septate, usually 4-septate. .0021—26 mm. long, .007—8 mm. broad.

On holly and beech. 1873.

SYN :—Nyl. in Flora 1874. p. 13.
BOT. PROV :—2...7.
ENGLAND :—Viney ridge, New Forest near Lyndhurst ! *Mr. Larbalestier.* (1873.)
WALES :—Trefriw !
This appears to me to be only a more diffuse or scattered state of *A. astroidea.* Although I do not find this identical state in the herbarium of the late Mr. Borrer, yet I do find there specimens which are intermediate between the typical state of *astroidea* and *astroidestera.*

**** *Spores 6-septate.*

28. *A. ilicina*, Tayl. *cream-colour*, thin, membranaceous, smooth, shining, scaly, limitate ; *ardellæ brownish-black, plane, shining, sub-immersed*, scattered, irregularly rounded or oblong, internally pale ; *spores* 8, colourless, *very large*, obovato-clavate, 6-*septate*, upper cell largest ; *gelatina hymenea persistently-blue with iodine.*

On holly, frequent. 1836.

SYN :—Tayl. Fl. Hib. 2. 105. (1836.) Leight. Br. Graph. 56. Mudd Man 248.
FIG :—Leight. l. c. t. 8. f. 36.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...19.
ENGLAND :—New Forest! Hants. *Mr. Lyell.* St. Leonard's Forest! Sussex. *Mr. Borrer.*
IRELAND :—Glengariff! *Miss Hutchins.* Cromaglown,! *Dr. Taylor.* (1836.) Killarney; Old Dromore and Glencar, Kerry; Glenbower Wood, Killeagh. *Mr. Carroll.* Derryclare! co. Galway. *Mr. Larbalestier.*
"Spores .007 in. long, by .002 in. broad at the apex, and by .001 in. at the base." (*Mudd.*) Spores .030 mm. long, .009—.010 mm. broad.

29. *A. ilicinella*, Nyl. similar to *A. ilicina*, Tayl. but generally smaller and with smaller spores, 3-5-6-septate; *gelatina hymenea vinoso-rubescent with iodine.*

On holly, rare. 1866.

SYN :—Nyl. in Flora 1867. p. 179. Crombie En. 102.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...26.
IRELAND :—Turk Mountain,! Killarney. *Mr. Carroll.* (1866.) Doughruagh Mountain! co Galway. *Mr. Larbalestier.*
"Spores .021—36 mm. long, .008—.012 mm. broad." (*Nyl.*) Spores .037 mm. long, .013 mm. broad.

***** *Spores murali-locular.*

30. *A. spectabilis*, Flot. *white*, thin, indeterminate, opake, rimose and unequal; *ardellæ black or fuscous-black*, opake, large, *anguloso-difformed or ramoso-incised*, often surrounded with a spurious thalline margin, internally concolorous; *spores* 8, colourless, oblong, *murali-locular*, (11 series) *large.*

On trees, rare.

SYN :—Flot. in litt. ad Schær. *A. difformis*, Nyl. Enum. 144. Crombie En. 103.
FIG :—Hepp Sporen t. 62. f. 536.
EXS :—Hepp 536. Anzi Langob. 206.
GEOG. DISTRIB :—Bavaria, Belgium, Hungary, Normandy, Germany, Italy, France, N. America.
BOT. PROV :—19.
IRELAND :—Crogham Mountain, Killarney. *Mr. Carroll.*
Spores .040 mm. long, .017 mm. broad.

31. *A. anastomosans*, Ach. *greyish-white or cream-colour*, thin, smooth, contiguous; *ardellæ minute, erumpent, simple or radiato-congregate*, scattered, brownish-black, plane; *spores* 8, colourless, oblong, *murali-locular, (6 or 7 series) small.*

On trees, rare. 1860.

SYN :—Ach. L. U. 146. (1810.) *Abrothelium dispersum*, Mudd Man. 252. Crombie En. 103.
FIG :—Mudd Man. t. 4. f. 99.
GEOG. DISTRIB :—Belgium, Pyrenees.
BOT. PROV :—19...31.
IRELAND :—Near Bantry. *Miss Hutchins.* Old Dromore! Glencarn and near Killarney, Kerry. *Mr. Carroll.*
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*
"Spores .004 to .005 in. long, by .002 in. broad t. 4 f. 99." (*Mudd.*) Spores .022 mm. long, .009 mm. broad.

****** *Parasitic species.*

32. *A. varians*, (Dav.) thallus none; *ardellæ parasitic, hymenicolar, rotundate, single or confluent, dull-black*, sessile, plane or more or less convex, roughish, internally pale-brown; *spores* 8, colourless, oblong, *normally* 3-*septate* (sometimes 2, sometimes 1-septate).

Parasitic on the apothecia of *Lecanora glaucoma*, frequent. 1793.

SYN:—Dav. in Linn. Soc. Tr. 2. p. 284. (1793.) Nyl. Scand. 260. *Arthonia glaucomaria & parasemoides*, Nyl. Arth. p. 98. Leight. in Ann. & Mag. Nat. Hist. Oct. 1856. Mudd Man. 251.

FIG:—Linn. Trans. 2. t. 28. f. 3. Ann. & Mag. Nat. Hist. 1856. t. 11. f. 1. 2. 3. 4. 5.

EXS:—Leight. 247. Mudd 238. Larbal. 47. Arn. 210. 211.

GEOG. DISTRIB:—Sweden, Finland, Norway, France, Bavaria, Austria.

BOT. PROV:—5, 6, 7...10...15...23...30, 31.

ENGLAND:—Cliffrigg! Ayton Moor! Yorkshire. *Mr. Mudd.* between Milnthorpe and Heversham, Westmoreland. *Mr. Martindale.* Haughmond Hill! Caer Caradoc! Long Mynd! Shropshire.

SCOTLAND:—Kincardine. *Rev. J. M. Crombie.*

IRELAND:—Barclay's Rock co. Down. *Adm. Jones.* Killiney. *Dr. Moore.* Lambay Island. *Mr. Carroll.*

WALES:—S. W. side of Anglesea. *Rev. Hugh Davies.* (1793.) Barmouth! Gimlet Rock! Pwllheli. Goodwick Bay! Pembrokeshire.

CHANNEL ISLANDS:—Petit Port! La Moye; Noirmont! Jersey. *Mr. Larbalestier.*

"Spores .003 in. long, by .001 in. broad." (*Mudd.*) "Spores .012—18 mm. long, .005—7 mm. broad." (*Nyl.*) Spores .016—.017 mm. long, .0065—.007 mm. broad.

33. *A. punctella*, Nyl. thallus none; *ardellæ parasitic, innato-subsessile, punctiform*, solitary, scattered; *spores* 6-8, colourless, obovato-clavate, 1-*septate*.

Parasitic on thallus of *Lecidea albo-atra*, (Hoffm.) rare. 1859.

SYN:—Nyl. MS. in Carroll's Contrib. to Irish Lichenol. p. 10. (1859.) Mudd Man. 252.

GEOG. DISTRIB:—Europe.

BOT. PROV:—20.

IRELAND:—Shore below Queenstown! *Mr. Carroll.* (1859.)

"Spores .0025 in. long, by .001 in. broad." (*Mudd.*)

34. *A. galactinaria*, Leight. thallus none; *ardellæ parasitic, hymenicolar, rotundato-difformed, single or confluent, nigro-fuscous*, more or less convex; *spores* 8, *colourless*, oblongo-ovoid, 1-*septate*.

Parasitic on the apothecia of *Lecanora galactina f. dispersa*, rare. 1876.

BOT. PROV:—5.

ENGLAND:—Old walls Barnsley Park! Gloucestershire. *Mr. Joshua.* (1876.)

I renders the gelatina hymenea of the matrix-apothecium blue, but tinges that of the Arthonia of a dark dingy-brown, except the spores in the asci, which are yellow-brown. The spores are frequently nucleolate with a tendency to form an additional septum, when old they become fuscous. Spores .011—.013 mm. long, .004—.005 mm. broad.

## IX. GRAPHIS, *Ach. Nyl.*

Thallus thin, epiphlæodal or hypophlæodal. Apothecia (lirellæ) black, linear, variously divided or simple, innate or immersed at the base. Perithecium black, lateral or entire. Spores colourless or fuscous, pluri-locular, coloured blue by iodine. Gelatina hymenea untinged by iodine. Paraphyses slender, distinct.

*A. Spores lineari-elongate or cylindrical, with many transversely oval cells.*

1. *G. elegans*, (Sm.) pale-cream-colour or greyish-white, thin membranaceous, granulate or rugose; *lirellæ erumpent, prominent*, sessile, oblong or lineari-elongate, simple, straight or curved; perithecium dimidiate or lateral, palmatifid; *epithecium* rimæform, *closed; proper margin* thick, tumid, prominent, *longitudinally furrowed;* spores 8, colourless, enveloped in a hyaline membrane, lineari-elongate or cylindrical, with 11-13 transversely oval cells.

On trees, myrica gale, stone-pine, oak, birch, finest on holly. common. 1807.

SYN :—Sm. E. Bot. 1812. (1807.) Ach. Syn. 85. Nyl. Prod. 151. *Aulacographa elegans*, Leight. Br. Graph. 45. Mudd Man. 242.
FIG :—E. Bot. t. 1812. Leight. Br. Graph. t. 7. f. 26.
EXS :—Schær. 515. Leight. 68. M. & N. 360. Nyl. 69. Mudd 223. Hepp 552. Körb. 286. Bohl. 27.
GEOG. DISTRIB :—Europe, France, Switzerland, Germany, Asia, America.
BOT. PROV :—1, 2, 3...5...7, 8...10...15...19...26.
ENGLAND :—Sussex! *Mr. Borrer.* (1807.) Oxfordshire! *Mr. Baxter in hb. Greville.* Crafnant! Shropshire. *Rev. T. Salwey.* Bardon Hill! Gracedieu! Leicestershire. *Rev. A. Bloxam.* St. Leonard's Forest! Sussex; Tunbridge Wells. *Mr. Thompson.* near Exeter; New Forest. *Rev. J. M. Crombie.* Berrow Wood! and Holly Bush Hill! Malvern Hills. *Mr. Lees.* Thornton Park, Essex. *Mr. Piggott.* Baysdale! Yorkshire. *Mr. Mudd.* Great Ayton! Yorkshire. *Mr. Dickson.* Pembridge! Herefordshire. *Rev. J. F. Crouch.* Midsummer Hill, Malvern. *Dr. Holl.* Haldon, Devon. *Mr. Parfitt.* Sevenoaks, Brastead, Kent. *Mr. Holmes.* Haughmond Hill! Nesscliffe Hill! Shropshire!
SCOTLAND :—West Highlands near Inverary; in Lorn at Bunawe. *Rev. J. M. Crombie.*
IRELAND :—Riverstone! and Ballymartle! co. Cork; Killarney! *Mr. Carroll.* Doughruagh Mountain! near Lough Muck! co. Galway. *Mr. Larbalestier.*
WALES :—Abertygwyn, Dolgelley. *Dr. Holl.* Gloddaeth! near Conway; Torrent Walk! near Dolgelley! Woods opposite Tanybwlch Hotel! near Capel Curig; Gwydir Woods! Bettws-y-coed! Trefriw! Edderton!
"Spores .009 to .012 in. long, by .002 to .00225 in. broad, t. 4. f. 9." *(Mudd.)* "Spores .040—54 mm. long, .007—.010 mm. broad." *(Nyl.)* Spores .055 mm. long, .013 mm. broad.

forma *coacervata*, Leight. *lirellæ heaped* one over another in small scattered clusters.

On holly. Huglith! near Church Stretton. *Mr. Phillips.* Holly Park, near Stokesay, Shropshire!

forma *stellata*, Leight. lirellæ *stellate*, distant, scattered.
On birch. Sussex! *Mr. Borrer.*

forma *parallela*, Schær. lirellæ straight, *parallel.*
On cherry. Raglith! Shropshire. (1875.)

2. *G. petrina*, Nyl. thallus scarcely any visible; *lirellæ black, linear, simple, subflexuose;* epithecium rimæform, narrow, *margin tumid, longitudinally furrowed, the furrows often white suffused;* perithecium black; spores 8, brownish, 8-12 locular.

On very wet micaceous rocks, extremely rare. 1876.

SYN :—Nyl. in Flora 1876. p. 310.
BOT. PROV :—26.
IRELAND :—Base of Letter Hill, Connemara. *Mr. Larbalestier.* (1876.)
Spores .036—.50 mm. long, .007—.011 mm. broad. Resembling *G. elegans.*

3. *G. scripta*, Ach. *cream-coloured or greyish-white*, thin, membranaceous or sub-tartareous, continuous, even or rugose; *lirellæ immersed*, slender, of the same width throughout, extremities obtuse, proper margin narrow, elevated, wavy and crisped; thallodal margin elevated, tumid; *epithecium canaliculate, naked or pruinose*; perithecium dimidiate or lateral; spores 8, colourless, elongato-linear or cylindrical, apically rounded, containing 8-10 transversely oval margined cells.

On trees, oak, ash, alder, beech, elm, cherry, plum, frequent and very variable.

SYN:—Ach. L. U. 265 (1810.) Syn. 81. Nyl. Scand. 251. *G. serpentina*. Leight. Br. Graph. 32. Mudd Man. 237.
FIG:—Leight. Br. Graph. t. 6. f. 19.
GEOG. DISTRIB:—Throughout the World.
BOT. PROV:—2, 3...5...7, 8...10...15...16...19...30, 31.

forma *minuta*, Leight. *thallus fusco-nigro-limitate; lirellæ very short and simple, straight;* epithecium rimæform or slightly canaliculate, naked or slightly pruinose; proper margin thickish, flexuose, uniform. (Leight. Br. Graph. p. 32.)

ENGLAND:—Sussex! *Mr. Borrer*. Crafnant near Oswestry. Shropshire! *Rev. T. Salwey*. Epping Forest; St. Leonard's Forest. *Rev. J. M. Crombie*.

forma *diffusa*, Leight. pale-olive, fusco-nigro-limitate or sub-effuse; *lirellæ elongated, simple*, curved, *distantly scattered;* epithecium rimæform, plane, naked; proper margin narrow, curved, flexuose, crisped. (Leight. Br. Graph. p. 33.)

ENGLAND:—Charlton Forest! Sussex. *Mr. Borrer*. Haldon Woods, Exeter. *Mr. Parfitt*. Tetsworth! Oxfordshire. *Mr. Larbalestier*.
IRELAND:—Derriquin! *Dr. Taylor*. Colin Glen, Belfast! *Mr. Thompson*.
WALES:—Woods near Capel Curig! Gwydir Woods! Bettws-y-coed.

forma *varia*, Leight. pale-yellow, fusco-nigro-limitate; *lirellæ elongated, immersed, very various* in shape, size, and disposition, rather crowded, *simple or branched or furcate, straight or wavy;* epithecium rimæform or slightly canaliculate, sub-pruinose; proper margin thin, flexuose and crisped. (Leight. Br. Graph. p. 33.)

ENGLAND:—Sussex! *Mr. Borrer*. near Little Malvern! Worcestershire. *Mr. Lees*. Gopsal! Leicestershire. *Rev. A. Bloxam*. Essex! *Mr. Piggott*.
WALES:—Woods near Capel Curig! Gwydir Woods! Bettws-y-coed.
CHANNEL ISLANDS:—St. Ouen's Manor Avenue! St. Peter's Valley! and Beaumont! Jersey. *Mr. Larbalestier*.

forma *flexuosa*, Leight. pale-yellow, fusco-nigro-limitate; *lirellæ very elongated and slender, flexuose, simple, immersed;* epithecium rimæform, very narrow, pruinose; proper margin thin, elevated, flexuose and crisped. (Leight. Br. Graph. p. 34. Zw. 304.)

ENGLAND:—Sussex! *Mr. Borrer*. Kelvedon, Essex. *Mr. Varenne*. Tetsworth! Oxfordshire. *Mr. Larbalestier*.
IRELAND:—Castlebernard Park! Cork. *Prof. Hincks*.
WALES:—Woods near Capel Curig! Gwydir Woods! Bettws-y-coed.
CHANNEL ISLANDS:—Common on all the larger Islands. *Mr. Larbalestier*.

forma *horizontalis*, Leight. whitish-yellow, fusco-nigro-limitate; *lirellæ crowded, very long and slender, disposed horizontally*, wavy, simple or furcate or crooked, immersed; epithecium rimæform,

exceedingly narrow, naked; proper margin slender, elevated, flexuose and crisped. (Leight. Br. Graph. 34. Exs. 244, Anzi It. S. 344. Mudd 217.)

ENGLAND :—Sussex! *Mr. Borrer.* Holly Bush Hill, Malvern Range, Worcestershire! *Mr. Lees.* Bousdale Gill, Cleveland! *Mr. Mudd.* Kelvedon, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* Abdon! Shropshire.
SCOTLAND :—Near Stirling. *Rev. J. M. Crombie.*
IRELAND :—Derryclare! co. Galway. *Mr. Larbalestier.*
WALES :—Edderton Wood! Montgomeryshire.

forma *divaricata*, Leight. pale-yellow, effuse; *lirellæ short and straight, with a central branch divaricate or at right angles;* epithecium narrow and canaliculate, pruinose; proper margin thickish, entire, flexuose. (Leight. Br. Graph. 35. Exs. 21. 19. Hepp 535. Larbal. 88. Anzi It. S. 341.)

ENGLAND :—Sussex! *Mr. Borrer.* Tunbridge Wells! *Mr. Thompson.* Oxfordshire! *Mr. Baxter.* Cliffrigg! *Mr. Mudd.* Abdon! Shropshire.
SCOTLAND :—Knockdolian! Ayrshire; Rammerscales! Dumfriesshire. *Mr. Thompson.*
IRELAND :—Colin Glen, Belfast! Bangor! Tullamore Park! co Down. *Mr. Thompson.*
WALES :—Gloddaeth! near Conway, Carnarvonshire; Woods near Capel Curig! Gwydir Woods! Bettws-y-coed. Edderton!
CHANNEL ISLANDS :—St. Lawrence Road! Beaumont! Rozel! Jersey. *Mr. Larbalestier.*

forma *recta*, (Humb.) *pale-yellow or straw-colour*, in horizontally elongated patches, nigro-limitate; *lirellæ* very numerous, elongated, narrow, simple, *horizontal and parallel, acuminate and sharply pointed at the extremities;* epithecium canaliculate, naked or subpruinose; proper margin thick, elevated, uniform. (Leight. Br. Graph. 38. t. 6. f. 20. Zw. 306. E. Bot. t. 2301. Hepp 46. 888. Anzi Ital. S. 343.)

ENGLAND :—Sussex! *Mr. Borrer.* Ingleby Park! Easby Wood; Baysdale, Cleveland. *Mr. Mudd.* New Forest. *Rev. J. M. Crombie.*
SCOTLAND :—Near Stirling. *Rev. J. M. Crombie.*
Spores .027 mm. long, .007 mm. broad.

forma *stellata*, Leight. pale-olive, fusco-nigro-limitate; lirellæ stellate, distant, few, scattered, rays simple, acute; epithecium canaliculate, naked; proper margin thick, uniform. (Leight. Br. Graph. 36).

ENGLAND :—Sussex! *Mr. Borrer.* Airyholme Wood; Hoggarts Wood; Ingleby Park. Cleveland. *Mr. Mudd.*
WALES :—Edderton!

Var. *serpentina*, Ach. *white and cinereous, thickish, tartareous,* pulverulent, cracked, determinate; *lirellæ immersed,* elongated, crowded, flexuose, simple or branched, obtuse, cæsio-pruinose; epithecium at length plane; proper margin thin, elevated; thallodal margin lateral, incrassate; spores as above.

On trees, oak, beech, ash, sweet-chestnut, frequent.

SYN :—Ach. L. U. 269 (1810.) Syn. 83. Nyl. Scand. 252. Prodr. 149. *Gr. diffracta*, Leight. Br. Graph. 39.
FIG :—Leight. Br. Graph. t. 6. f. 21.
EXS :—Mudd 221. 222.
GEOG. DISTRIB :—Europe, America.
ENGLAND :—Tilgate Forest! Sussex. *Mr. Borrer.* near Little Malvern!

Worcestershire. *Mr. Lees.* Airyholme Wood! Cleveland. *Mr. Mudd.* New Forest! Hants. *Mr. Lyell.* Penzance! *Rev. T. Salwey.* Devon. *Mr. Parfitt.* New Forest; Epping Forest. *Rev. J. M. Crombie.* Dunton Green, Kent. *Mr. Holmes.* Abdon! Nesscliffe Hill! Shropshire.

SCOTLAND:—Falls of Clyde; near Stirling. Callander, &c. *Rev. J. M. Crombie.*

IRELAND:—Duncombe's Wood! Cork. *Mr. Carroll.*

WALES:—Edderton Wood! Montgomeryshire. Gwydir Woods! Bettws-y-coed.

CHANNEL ISLANDS:—Rozel Woods! Jersey. *Mr. Larbalestier.*

Varies with a larger and smaller form of lirellæ, and with radiate and flexuose ones.

forma *eutypa*, Ach. pale-yellow or greyish-white, pulverulent; lirellæ crowded, flexuose, prominent, simple or branched; *epithecium very wide, canaliculate, plane or concave, cæsio-pruinose;* proper margin thick, elevated, curved and wavy. (Leight. Br. Graph. 37. Mudd 220. Schær. 91.)

ENGLAND:—Ardingley! St. Leonard's Forest! Sussex! *Mr. Borrer.* New Forest! Hants. *Mr. Lyell.* Oxfordshire! *Mr. Baxter.* Berrow! Malvern Hills. *Mr. Lees.* Donnington Park! Leicestershire. *Rev. A. Bloxam.* Ingleby Park! Cleveland. *Mr. Mudd.* Stokewood, Exeter. *Mr. Parfitt.* Kelvedon. Essex. *Mr. Varenne.* Park, Cirencester. *Mr. W. Joshua.*

SCOTLAND:—Common in Central Counties. *Rev. J. M. Crombie.*

IRELAND:—Cultra! co. Down; Knocknageney! Belfast. *Mr. Thompson.* Ballynahinch. *Mr. Larbalestier.*

WALES:—Builth!

CHANNEL ISLANDS:—Rozel! Jersey. *Mr. Larbalestier.*

Spores .027—.038 mm. long, .007—010 mm. broad.

forma *spathea*, Ach. pale-yellow, fusco-nigro-limitate; *lirellæ moderately long, simple, curved, numerous, scattered in all directions, approximate,* sub-immersed; epithecium rimæform, nearly closed; proper margin thick, incurved, flexuose. (Leight Br. Graph. 36.)

ENGLAND:—St. Leonard's Forest! Sussex. *Mr. Borrer.*

SCOTLAND:—Central Counties. *Rev. J. M. Crombie.*

forma *tremulans*, Leight. pale-ashy-yellow or ashy-grey; *lirellæ elongated, simple, peculiarly tremulous and wavy, prominent;* epithecium canaliculate, pruinose; proper margin narrow, excessively flexuose and crisped. (Leight. Br. Graph. 37. Exs. 22. Mudd 219.)

ENGLAND:—Sussex! *Mr. Borrer.* Gopsall Wood! Leicestershire. *Rev. A. Bloxam.* Chelmsford! Essex. *Mr. Piggott.* Kildale! Airyholme Wood! Cliffrigg! Cleveland. *Mr. Mudd.* Pentregaer! near Oswestry; Weir Coppice! near Shrewsbury, Shropshire.

IRELAND:—Killarney! *Mr. Thompson.*

WALES:—Corsygedol! near Barmouth. *Rev. T. Salwey.*

CHANNEL ISLANDS:—Common on all the larger Islands. *Mr. Larbalestier.*

forma *radiata*, Leight. whitish-yellow, effuse; *lirellæ sub-immersed, crowded, centrally radiate; epithecium* widely *canaliculate, cæsio-pruinose;* proper margin stout, elevated, unequal, singularly flexuose and crisped. (Leight. Br. Graph. 35. Exs. 340. Mudd 218.)

ENGLAND:—Sussex! *Mr. Borrer.* Newton Wood! Cleveland. *Mr. Mudd.* Devon. *Mr. Parfitt.* Abdon! Shropshire.

Var. *pulverulenta*, Ach. *whitish*, effuse; *apothecia emergent*, flexuose; *epithecium* canaliculate, *dehiscent, cæsio-pruinose; thallodal margin* elevated, *tumid.*

On trees, ash, rare.

SYN :—Ach. L. U. 266 (1810.) Syn. 82. Nyl. Scand. 252. Prodr. 149.
EXS :—Nyl. 70.
GEOG. DISTRIB:—Europe.
ENGLAND :—New Forest; Epping Forest. *Rev. J. M. Crombie.* Airyholme Wood! Yorkshire. *Mr. Mudd.* Abdon! Shropshire.
SCOTLAND :—Falls of Clyde; near Stirling; Callander, &c. *Rev. J. M. Crombie.*
IRELAND :—Blarney! Cork. *Mr. Carroll.* near Lough Muck! co. Galway. *Mr. Larbalestier.*
WALES :—Edderton! Montgomeryshire. Gwydir Woods! Bettws-y-coed. Trefriw!
CHANNEL ISLANDS :—Common on all the larger Islands and Jethou. *Mr. Larbalestier.*

4. *G. dendritica*, (Ach.) *cream-coloured or yellowish-white*, thin, *tartareous, pulverulent*; *lirellæ* brownish-black, *immersed*, branched in a *pedato-radiate* manner; *perithecium a very thin black cartilaginous entire membrane; epithecium* broad, plane, *dilated, cæsio-pruinose;* proper margin very thin; thallodal margin prominent, rugose; spores 8, colourless, elongato-linear, apically rounded, containing 6-8 transversely oval margined cells.

On trees, beech, rare. 1807.

forma *Smithii*, Leight. lirellæ ramifying at an *obtuse* angle, extremities *acute*, thallodal margin *prominent*. (Leight. Br. Graph. 43.)

SYN :—*Opegrapha*, Ach. Meth. 31. (1803.) *Graphis*, Ach. Syn. 83. Nyl. Prodr. 150. Mudd Man. 241. *Hymenodecton*, Leight. Br. Graph. 43.
FIG :—E. Bot. 1756. Leight. Br. Graph. t. 7. f. 23.
EXS :—Rabh. 826. Arn. 334. in part.
GEOG. DISTRIB :—Germany, France, Prussia, Pyrenees, America.
BOT. PROV :—1, 2, 3...5, 6. 7...19...31.
ENGLAND :—Sussex! *Mr. Borrer.* (1807.) New Forest! Hants. *Mr. Lyell.* Epping Forest. *Rev. J. M. Crombie.* near Totness and Coryton, S. Devon. *Dr. Holl.* Haldon Wood, Exeter. *Mr. Parfitt.* Hickmore Fen Wood, Essex. *Mr. Varenne.* Ivybridge; Plymouth. *Mr. Holmes.* New Forest; Epping Forest; St. Leonard's Forest. *Rev. J. M. Crombie.* Rora and Penn Woods, Islington, Devon. *Messrs. Jones & Kingston.* Holly Bush Hill, Malvern Range, *Mr. Lees.* Craigforda! Shropshire.
IRELAND :—Castle Bernard Park! Bandon. *Rev. Prof. Hincks.*
WALES :—Corsygedol! near Barmouth. *Rev. T. Salwey.*
CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier.*
"Spores .008 to .011 in. long, by .0015 to .002 in. broad." (*Mudd.*)

forma *acuta*, Leight. lirellæ ramifying at a very *acute* angle, *nearly parallel*, extremities simple, *acuminate*; thallodal margin *prominent*. (Leight. Br. Graph. 44. Schær. Exs. 585. Larbal 41.)

ENGLAND :—St. Leonard's Forest! Sussex. *Mr. Borrer.*
IRELAND :—Castlebernard Park! Cork. *Mr. Carroll.*
WALES :—Upton! Pembrokeshire. *Rev. T. Salwey.*
CHANNEL ISLANDS :— Beaumont! and Rozel! Jersey. *Mr. Larbalestier.*
Spores .042 mm. long, .009 mm. broad.

forma *obtusa*, Leight. lirellæ ramifying at an *obtuse* angle in a *furcate* manner, extremities very *obtuse*, frequently *furcate*; thallodal margin nearly *obliterated*. (Leight. Br. Graph. 44.)

ENGLAND :—St. Leonard's Forest! Sussex. *Mr. Borrer.* Tunbridge Wells! *Mr. Thompson.* Torquay! *Dr. Deakin.* Epping Forest. *Rev. J. M. Crombie.*
IRELAND :—Castlebernard Park! Cork. *Mr. Carroll.*
WALES :—Pembrokeshire! *Rev. T. Salwey.* Dolgelley!

5. *G. inusta*, Ach. *pale-yellowish-white*, thin, *membranceous*,

even or rugose; *lirellæ* black, *immersed*, broad, *simple or branched in a sub-radiate sub-parallel* manner; *perithecium lateral; epithecium* plane, *naked or pruinose;* proper margin very narrow; thallodal margin thin and membranous; spores 8, fuscescent, linear or elongato-linear, apically rounded, containing 6-8 transversely oval margined cells.

On trees, oak, hazel, thorn, beech, sycamore, frequent. 1807.

Forma *vera*, Leight. lirellæ *radiate*, like Chinese characters.

SYN:—Ach. Syn. 85. (1817.) *G. Smithii*, Leight. Br. Graph. 41. 42. Nyl. Prodr. 150. Mudd Man. 240.
FIG:—E. Bot. t. 1813. Leight. Br. Graph. t. 6. f. 22.
EXS:—Larbal. 89.
GEOG. DISTRIB:—Europe, France, Prussia, Asia, America.
BOT. PROV:—1, 2, 3 . 5...7, 8...19...30, 31.
ENGLAND:—Sussex! St. Leonard's Forest! *Mr. Borrer.* (1807). Malvern Hills! *Mr. Lees.* The Lodge near Ludlow! *Rev. T. Salwey.* Harpford Wood, Devon. *Miss Attwood.* Inworth, Essex. *Mr. Varenne.* Epping Forest. *Rev. J. M. Crombie.*
CHANNEL ISLANDS:—Guernsey; Beaumont, St. Lawrence! St. Peter's Valley! Rozel Manor! Jersey. *Mr. Larbalestier.*
Spores .028—.035 mm. long, .009 mm. broad.

forma *elongata*, Leight. lirellæ much more *simple, slightly branched*, lineari-oblong or lanceolate, extremities acute. (Leight. Br. Graph. 42.)

ENGLAND:—Sussex! *Mr. Borrer.* Pod's Wood! Messing, Essex. *Mr. Varenne.*
IRELAND:—Bangor, co. Down! *Mr. Thompson.* Kylemore! *Mr. Larbalestier.*
WALES:—Corsygedol! near Barmouth. *Rev. T. Salwey.* Gloddaeth! Carnarvonshire.
CHANNEL ISLANDS:—St. Lawrence! Jersey. *Mr. Larbalestier.*

forma *divaricata*, Leight. lirellæ with a simple *branch at right angles.* (Leight. Br. Graph. 42.)

ENGLAND:—Sussex! *Mr. Borrer.* Gopsall! Leicestershire. *Rev. A. Bloxam.* Oxfordshire! *Mr. Baxter.*
IRELAND:—Dunscombe's Wood! Cork. *Mr. Carroll.*
WALES:—Dolgelley!
CHANNEL ISLANDS:—Beaumont! Jersey. *Mr. Larbalestier.*

forma *simpliciuscula.* Leight. lirellæ smaller, *simple, scattered.* (Leight. Br. Graph. 42. Larbal. 90.)

ENGLAND:—Sussex! *Mr. Borrer.* Marks Hall Wood; Pod's Wood, Messing, Essex. *Mr. Varenne.*
IRELAND:—Castlebernard Park! Cork. *Prof. Hincks.*
WALES:—Gwydir Woods! Bettws-y-coed.
CHANNEL ISLANDS:—Rozel! Jersey. *Mr. Larbalestier.*

forma *macularis*, Leight. lirellæ small, numerous, crowded, *rounded or oblong.* (Leight. Br. Graph. 42. Exs. 285.)

ENGLAND:—Sussex! *Mr. Borrer.* Ragley Wood near Oxford! *Mr. Baxter.* Llandrindod! *Rev. T. Salwey.* Marks Hall Wood; Essex. *Mr. Varenne.* Ickworth Park and Great Glennam, Suffolk. *Rev. E. N. Bloomfield.*
IRELAND:—Bangor and Cultra and Holywood House, co. Down! *Mr. Thompson.* Castlebernard Park! Blarney! Cork. *Mr. Carroll.*
WALES:—Ynysfaig! near Barmouth; Dolgelley!
CHANNEL ISLANDS:—St. Peter's Valley! Jersey. *Mr. Larbalestier.*

6. *G. Lyellii*, Sm. *pale-olive*, thin, *ceraceo-membranaceous*, smooth; *lirellæ* brownish-black, *prominent*, sessile, oblong or lineari-oblong, simple, curved; *perithecium carbonaceous, entire;*

*epithecium plane, broad, pruinose;* proper margin narrow, prominent; *thallodal margin* elevated, *white*, pulverulent; spores 8, fuscescent, lineari-elongate, apically obtuse, containing 7-8 transversely oval margined cells.

On trees, rare. 1808.

SYN :—*Opegrapha*, Sm. E. Bot. 1876. (1808.) *Graphis*, Ach. Syn. 85. Nyl. Prodr. 151. *Chiographa Lyellii*, Leight. Br. Graphid. 44. Mudd Man. 241.
FIG :—E. Bot. t. 1876. Leight. Br. Graph. t. 7. f. 24.
GEOG. DISTRIB :—France.
BOT. PROV :—1, 2...19...31.
ENGLAND :—New Forest! Hampshire. *Mr. Lyell.* (1808.) Harpford, co. Devon; Launceston, Cornwall; Ringwood in New Forest. *Rev. J. M. Crombie.* near Coryton, S. Devon; near Popes's Mill, Liskeard, Cornwall, *Dr. Holl.* Penn Wood, Devon. *Messrs. Jones & Kingston.*
IRELAND :—Castlebernard Park! co. Cork. *Mr. Carroll.* Mr. Carroll in this locality has detected several curious forms, viz.: *radiata*, Carr.! in which the lirellæ are stellately arranged, their apices more or less acute; *fastigiata*, Carr.! where the lirellæ are obtuse at the apices and subdendritically arranged; *macularis*, Carr.! in which the lirellæ are smaller, round or oblong, confluent into obtusely crenate groups.
CHANNEL ISLANDS :—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .005 to .007 in. long, by .00125 to .00175 in. broad." *(Mudd.)* Spores .028—.033 mm. long, .006—.008 mm. broad.

7. *G. ramificans*, Nyl. *whitish or creamy-white*, very thin, subrugulose, effuse, *(K yellow then orange); lirellæ black, naked, striatulate*, slightly prominent, *dendroideo-ramose; epithecium narrow*, slightly expanded; *perithecium lateral; proper margin thin, wavy and crisped;* paraphyses thick, oleoso-articulate, apices globular; spores 8, colourless, at length pale-rufescent, elongato-linear or cylindrical, apically rounded, with 10-12 transversely oval margined cells.

On Ilex, very rare. 1876.

SYN :—Nyl. in Flora 1876. p. 575.
BOT. PROV :—26.
IRELAND :—Holly Island! Lough Inagh. *Mr. Larbalestier.* (1876.)
Spores .032—45 mm. long, .008—.010 mm. broad. Thecæ I lutescent.

## B. *Spores murali-locular.*

8. *G. Ruiziana*, (Fée.) *greyish-cream-coloured*, thin, membranaceous, smooth, nigro-limitate; *lirellæ excessively prominent and sessile*, large, *lineari-oblong, obtuse at the extremities*, straight or wavy, simple, occasionally tripartite; *epithecium rimæform*, more or less expanded; *perithecium thick, carbonaceous, entire; proper margin tumid and connivent*; spores 8, colourless, oblong or elliptical, murali-locular, large.

On holly, hawthorn, gorse, rare. 1857.

SYN :—Fée Essai p. 27. (1824.) Nyl. N. Gran. 73. *Opegrapha anomala*, Leight. Ann. and Mag. Nat. Hist. 1857.
FIG :—Ann. and Mag. Nat. Hist. t. 8. f. 1.—6.
GEOG. DISTRIB :—N. Granada, Europe.
BOT. PROV :—1...6,...19.
ENGLAND :—Ivybridge, Devon; Wilhiel near Bodmin. *Mr. Tellam.*
IRELAND :—Glengariffe! co. Kerry. *Mr. Piggott.* (1857.) Castlemartyr Deer park! Glenbower, Killeagh. *Mr. Carroll.* Killarney. *Messrs. Piggott & Carroll.*
WALES :—Fort Hill! Llanachar Road! near Fishguard, Pembrokeshire.
Spores .044 mm. long, .018 mm. broad.

9. *G. sophistica*, Nyl. pale-whitish-yellow or cream-colour, thin, *membranaceous*, continuous, smooth or slightly uneven; *lirellæ* black, *emergent*, *slender*, contracted here and there, simple or branched, wavy and scattered, *extremities acuminate*; perithecium lateral; *epithecium rimæform*, *naked*; *proper margin thin*, elevated, wavy and crisped; *thallodal margin membranaceous*; spores 8, colourless, oblong or ellipsoid, murali-multilocular.

On trees, oak, frequent.

SYN :—Nyl. N. Gran. 74. (1864.) *Gr. scripta*, Leight. Br. Graph. p. 27, and *Gr. pulverulenta*, Leight. Br. Graph. p. 31.
FIG :—Leight. Br. Graph. t. 6. f. 17.
EXS :—Lindig 71.
GEOG. DISTRIB :—France, N. Granada, N. Zealand.
BOT. PROV :—2, 3...5...7, 8...11...13, 14, 15...19...33.

The following forms are noticeable.

forma *diffusa*, Leight. lirellæ rather *long*, *simple* or with a single branch, variously *curved* and wavy, *lying in all directions*. (Leight. Br. Graph. p. 27. Bohl. 28.)

ENGLAND :—Sussex! *Mr. Borrer*. Stoke Wood, Exeter. *Mr. Parfitt*.
IRELAND :—Cultra! co. Down; Colin Glen! Belfast. *Mr. Thompson*.
WALES :—Edderton! Montgomeryshire. Bettws-y-coed!
Spores .037—.040 mm. long, .0165—.025 mm. broad.

forma *flexuosa*, Leight. lirellæ *elongated*, *simple or branched*, *flexuose*. (Leight. Br. Graph. p. 28. Exs. 18. Hoffm. En. t. 3. f. 26.)

ENGLAND :—Sussex! *Mr. Borrer*. New Forest! Hants. *Mr. Lyell*. Oswestry! Shropshire. *Rev. T. Salwey*. Gopsal! Leicestershire. *Rev. A. Bloxam*.
SCOTLAND :—Loch Tay Woods! *Dr. Greville*.
IRELAND :—Ballinahinch! Galway. *Mr. Larbalestier*.
WALES :—Gloddaeth! near Conway.

forma *radiata*, Leight. lirellæ *dendritically radiate*. (Leight. Br. Graph. p. 29. Mudd 215.)

ENGLAND :—Sussex! *Mr. Borrer*.
SCOTLAND :—Rammerscales! Dumfriesshire. *Mr. Thompson*.
IRELAND :—Cultra! co. Down. *Mr. Thompson*.
WALES :—Gwydir Woods! Bettws-y.coed.

forma *divaricata*, Leight. lirellæ *divaricately branched*. (Leight. Br. Graph. p. 29. Exs. 19. Mudd 216. Hoffm. En. t. 3. f. 2. a.)

ENGLAND :—Sussex! *Mr. Borrer*. Berwick-on-Tweed! *Dr. Johnston*. Twycross! Leicestershire. *Rev. A. Bloxam*.
SCOTLAND :—Rae Hill Woods! *Dr. Greville*.
IRELAND :—Bangor! co. Down. *Mr. Thompson*. Castlebernard Park! Bandon. *Rev. Prof. Hincks*.
WALES :—Gloddaeth! near Conway. Gwydir Woods! Bettws-y-coed.

Var. *pulverulenta*, (Sm.) pale-dull-ashy-yellow or cream-colour, *thin or tartareous and pulverulent*, continuous, rugulose; *lirellæ sub-sessile*, *broadish*, *extremities cuspidate*; perithecium lateral; *epithecium broadly canaliculate pruinose*; *proper margin thick*, elevated, uniform; *thallodal margin elevated*, *tumid*; spores 8, colourless, oblong or ellipsoid, murali-multilocular.

SYN :—Sm. E. Bot. 1754. (1807.) Leight. Br. Graph. p. 31.
FIG :—E. Bot. 1754. Leight. Br. Graph. t. 6. f. 18.
EXS :—Leight. 20.

GEOG. DISTRIB :—Europe,
BOT. PROV :—2, 3...5...7, 8...19...26...30...31.
ENGLAND :—Sussex ! *Mr. Borrer.* Hartshill Wood ! near Atherstone ! Gopsall Wood ! Donnington Park ! Leicestershire. *Rev. A. Bloxam.* near the Berrow, S. end of Malvern Hills ! *Mr. Lees.* New Forest ! Hants. *Mr. Lyell.* Haldon, Exeter. *Mr. Parfitt.* Kelvedon ! Braxted ; Messing, Essex. *Mr. Varenne.*
IRELAND :—Montalto ! Cultra ! Bangor ! co. Down. *Mr. Thompson.* Blarney ! co. Cork. *Mr. Carroll.* Lord Sligo's Demesne, Westport ! co. Mayo. *Mr. Larbalestier.*
WALES :—Barmouth ! *Rev. T. Salwey.* Gloddaeth ! near Conway ; Gwydir Woods ! Bettws-y-coed.
CHANNEL ISLANDS :—St. Peter's Valley ! Jersey. *Mr. Larbalestier.*
Spores .037 mm. long, .017 mm. broad.

var. *dendriticoides*, Leight. lirellæ *immersed*, branched in a *pedato-radiate* manner ; epithecium dilated cæsio-pruinose.

On holly. (1875.)

Holly Park near Stokesay, Shropshire !

10. *G. inustula*, Nyl. milk-white, subrimulose, (K-yellow) ; *lirellæ immersed, with* 2-3 *cuspidate branches ; epithecium cæsio-pruinose, plane ; spores* 8, colourless, oblong, *murali-locular.*

On holly, rare. 1877.

SYN :—Nyl. in Flora 1877. p. 566.
BOT. PROV :—26.
IRELAND :—Lord Sligo's Demesne, Westport ! co. Mayo. *Mr. Larbalestier.* (1877.)
"Like *G. inusta*, but with different spores .038 –48 mm. long, .015—20 mm. broad." *(Nyl.)* Spores .034 mm. long, .015 mm. broad.

## X. CHIODECTON. *Ach.*

Thallus thin, whitish, with scattered elevated sub-rotund white pulverulent verrucæ. Apothecia pale-brown, pruinose, substellato-radiate, plane, aggregated or confluent and immersed in the verrucæ. Hymenium ceraceo-gelatinose, pale, supported on the vertical divisions of an opaque blackish-brown hypothecium. Paraphyses distinct. Spores 8, fusiform, 3-septate. Spermatia acicular, arcuate.

1. *C. albidum*, (Tayl.) *whitish, sub-squamoso-areolate, dispersed,* pulverulent ; *thallodal verrucæ, scattered,* elevated, sub-rotund, depressed ; *apothecia pale-brown,* naked or pruinose, *sub-stellato-radiate ; spores* 8, colourless, *broadly lineari-fusiform,* 3-*septate.*

On shaded rocks, very rare.

SYN :—*Syncesia albida*, Tayl. Fl. Hib. 2. 163. (1836.) *Chiodecton*, Leight. Ang. Lich. 25. Mudd Man. 245.
FIG :—Leight. l. c. t. 8. f. 4. t. 9. f. 1.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...30.
IRELAND :—Between Dunkerron and Killarney ; Kerry ! *Dr. Taylor.* (1836.) co. Antrim. *Dr. Moore.*
Spores .030—.040 mm. long, .005—.006 mm. broad.

Var. *Sarniense*, Salw. *white* or cream-coloured, *thick,* tartareous, *colliculoso-verrucose ; apothecia albo-pruinose.*

On maritime rocks, rare. 1847.

SYN : –*Chiodecton Sarniense*, Salw. in litt. 1859. Mudd Man. 245. *Chiodecto petræum*, Del.
GEOG. DISTRIB :—Europe.

Bot. Prov :—31.
Channel Islands :—Jerbourg ! Guernsey. *Rev. T. Salwey.* (1847.) La Coupe and Boulay Bay ! Jersey. *Mr. Larbalestier.* Sark. *Mrs. Collings.*

## XI. GLYPHIS, *Ach.*

Thallus often hypophlæodal or obsolete, bearing scattered, white, rotundato-irregular, plano-depressed, large verrucæ. Apothecia numerous, immersed in the verrucæ, black, elongato-flexuose and intricate, impressed or canaliculate. Spores colourless or fuscous, containing 4-10 transverse, ellipsoid-lenticular cells.

1. *G. labyrinthica*, Ach. fuscescenti-subolivaceous ; *verrucæ white, plano-convex, pulverulent, subreticulate with the sub-anastomosing black canaliculate rimæ* of the elongated apothecia ; spores 8, colourless, ultimately slightly fuscescent, lineari-oblong, rounded at the extremities, 4-6 celled ; paraphyses crowded, indistinct ; gelatina hymenea untinged with iodine.

On trees, very rare.

Syn :—Ach. Syn. 107. (1817.)
Fig :—Linn. Trans. 12. t. 2. f. 1. Fée Ess. Crypt. t. 16. f. 3. Fée Mem. Lich. t. 1. f. 2. Linn. Trans. 27. t. 36. f. 68.
Exs :—Spruce Lich. Amaz. 405.
Geog. Distrib :—Guyana, Amazons, Ceylon.
Bot. Prov :—13.
Ireland :—Killarney. *Sir Thos. Gage.* in Herb. Brit. Mus. *teste Rev. J. M. Crombie.*
Spores .021 mm. long, .0065 mm. broad.

## XII. MELASPILEA, *Nyl.*

Thallus very thin or obsolete. Apothecia arthonoid, black, superficial. Paraphyses distinct. Spores 8, generally colourless, 1-septate. Spermatia straight. Gelatina hymenea only yellow with iodine.

1. *M. amota*, Nyl. *whitish*, macular, indeterminate ; *apothecia black, innate, rotundate or rotundato-difformed*, proper margin thin, unequal ; hypothecium slightly darkened ; *spores* 4-8, *colourless, rotundo-oblong*, 1-septate, constricted.

On old trees, usually on oak, rare. 1866.

Syn :—Nyl. in Flora 1867. p. 178. Crombie En. 105.
Geog. Distrib :—Europe.
Bot. Prov :—19.
Ireland :—Turk Mountain ! Killarney ! *Mr. Carroll.*
"Spores .016—22 mm. long, .007—.010 mm. broad." (*Nyl.*) Spores .017 mm. long, .008 mm. broad.

2. *M. ochrothalamia*, Nyl. very thin, *dirty-virescent*, indeterminate ; *apothecia black or fuscous*, opake, patellulate, *minute, adnate*, plane, obsoletely margined, *internally luteoochraceous ; spores* 8, *fusco-nigrescent*, lineari-oblong, 1-septate, constricted.

On willow, rare. 1869.

Syn :—Nyl. in Flora 1865. p. 355. Crombie En. 106.
Geog. Distrib :—France.
Bot. Prov :—19.

IRELAND :—Enniskeam ! co. Cork ; Mangerton, Killarney ; Glenbower Wood Killeagh co. Cork. *Mr. Carroll.* (1869.)
"Spores .017—21 mm. long, .007—.010 mm. broad." (*Nyl.*) Spores .0115—.0135 mm. long, .004 mm. broad.

3. *M. vermifera*, Leight. thallus *obsolete ; apothecia black*, very minute, *irregularly angulari-oblong*, imbedded in the cortical layer, *when dry plane and surrounded by a minute upraised jagged margin of the cortical layer*, when wet plano-convex, the margin obliterated ; hymenium pale ; paraphyses very delicate and slender, apices pale ; asci lineari-obovate ; *spores innumerable*, colourless, *arranged spirally* in the ascus, cylindrico-fusiform, pointed and arcuate at each end, *vermiform*, 1-septate.

Parasitic on thallus and apothecia of *Variolaria discoidea*, T. & B. (*Pertusaria globulifera*, Turn.) very sparingly.

SYN :—Leight. in Linn. Trans. 2nd ser. 1. 146.
FIG :—Linn. Trans. l. c. t. 22. f. 21. 22. 23. 24.
BOT. PROV :—7.
WALES :—Trefriw ! (1874.)
Gelatina hymenea I—. Spores .022 mm. long, .002 mm. broad.

4. *M. Patersoni*, Stirtn. *whitish* or pale, thin or evanescent ; *apothecia black, plane*, or somewhat convex, *small ;* hypothecium fuscescent or pale ; *paraphyses* filiform, somewhat *branched*, apices interwoven, dark ; *spores* 4 *or* 5, colourless, aciculari-cylindrical, *pluriseptate or* 10-*septate, breaking up at the septa.*

On dead bark. 1874.

SYN :—Stirton in Scott. Naturalist 4. p. 29. (1877.)
BOT. PROV :—16.
SCOTLAND :—Ben Brecht, Argyleshire. *Mr. Paterson.* (1874.)
"Spores .04—.06 mm. long, .0025—.003 mm. broad. Hypothecium I slightly blue, hymenium I—, thecæ fulvescent." *(Stirt.)*

## TRIBE XVII. PERIDIEI.

Hymenia covered by a black rimuloso-dehiscent peridium.

### I. MYCOPORUM, *Flot.*

Thallus thin or obsolete. Apothecia fuscous-black or black, rotundato-difformed or linear, containing many hymenia conjoined as in a common excipulum, but without perithecium. Paraphyses indistinct. Spores 8, oblong, variously septate, septa irregular.

1. *M. sparsellum*, Nyl. *white*, very thin, determinate, or indicated by a dilated darkly-limitate white or whitish spot ; *apothecia black, rotundate, prominent, rugose*, somewhat irregular, internally pale and colourless ; hypothecium colourless ; paraphyses indistinct ; *spores* 8, colourless, ovoid, 1-*septate ;* gelatina hymenea untinged with iodine.

On holly, very rare.

SYN :—Nyl. N. Gran. Addit. 575. (1857.) Crombie En. 106.
EXS :—Lindig 62.
GEOG. DISTRIB :—N. Granada.
BOT. PROV :—19.
IRELAND :—Cromaglown, Killarney. *Mr. Carroll.*
"Spores .018—21 mm. long, .007—8 mm. broad." *(Nyl.)*

2. *M. miserrimum*, Nyl. thallus indicated by a *pale* spot or obsolete; *apothecia minute, difformed, black, macular*, 2-6-*nodulose* (nodules convex, resembling the conceptacula of a Verrucaria, but without any impressed epithecium), internally and basally whitish, *depressed between the nodules;* asci sphæroid or oblongo-sphæroid; *spores* 8, colourless, *oblong*, 3-5 *septate (often variously and longitudinally sparingly divided);* paraphyses none; thalamium colourless, laxly indistinctly cellulose; conceptaculum nigricant, conspicuously fusco-cellulose; gelatina hymenea untinged with iodine, but the protoplasm of the asci vinous-red.

On trees in sub-alpine regions, frequent.

SYN:—Nyl. Enum. 145. (1858.) Crombie En. 106.
EXS:—Mudd 231.
GEOG. DISTRIB:—France.
BOT. PROV:—2...5...7...10.
ENGLAND:—Hoggart's Wood! Ingleby, Cleveland. *Mr. Mudd.* Harley Wood! Cirencester. *Mr. Joshua.* between Polegate and Westham, Sussex! *Mr. Roper.* Lyd Hole, Pontesford! Shropshire; Huglith! near Church Stretton.
WALES:—Edderton Wood! Montgomeryshire.
"Spores .015 mm. long, .005 mm. broad." *(Nyl.)* Spores .018 mm. long, .008 mm. broad.

3. *M. ptelœodes*, Nyl. *pale-dirty, macular*, more or less diffuse; *apothecia black, minute, rotundate*, somewhat convex; *verrucaroid, simple*, crowded; *spores* 8, colourless, *ovoid* or *ovoideo-ellipsoid, 3-septate*, generally *with a single longitudinal septum* between the transverse ones.

On trees, alder, rare. 1875.

SYN:—Nyl. Lich. Scand. Appendix 291. (1861.)
EXS:—Nyl. Pyren. Orient. 78.
GEOG. DISTRIB:—France, Pyrenees.
BOT. PROV:—5.
ENGLAND:—Cleve Hill! Cheltenham. *Mr. Joshua.*
"Spores .012—16 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .016 mm. long, .006 mm. broad.

## II. RIMULARIA, *Nyl.*

Thallus thin, crustaceous. Apothecia black, rotundate, depressed in the centre, dehiscing by a subradiate fissure. Paraphyses slender, often branched. Spores 8, colourless or fuscescent, ellipsoid, simple.

1. *R. limborina*, Nyl, cinereous, thin, rimulose or sub-areolate; apothecia black or fuscous-black, opake, rugulose, depressed, somewhat convex, rotundate or oblongo-rotundate, depressed in the centre and fissured by a thin sub-radiate chink, internally cinerascent; spores 8, colourless, at length fuscescent or fuscous, ellipsoid, simple; paraphyses slender, irregular and generally branched; perithecium (peridium) black in upper part, below (hypothecium) fusco-nigricant; gelatina hymenea slightly-blue with iodine and then fulvous-red.

On calcareous mountain rocks, rare. 1865.

SYN:—Nyl, in Flora 1868. p. 346, Crombie in Seem. Journ. Bot. 7, 50

GEOG. DISTRIB :—France.
BOT. PROV :—15.
SCOTLAND :—Craig Guie, Braemar. *Rev. J. M. Crombie.*
"Spores .018—25 mm. long, .011—16 mm. broad." (*Nyl.*)

## SERIES VI. PYRENODEI.

Fructification in closed receptacle.

### TRIBE XVIII. PYRENOCARPEI.

Thallus various, peltate, squamulose, areolate, continuous, hypophlæodal or evanescent. Apothecia pyrenodine. hymenium enclosed in an entire or dimidiate black perithecium with an apical poriform epithecium.

### I. THELOCARPON, *Nyl.*

Thallus thin, crustaceous. Apothecia granuloso-verrucæform, ostiole punctiform. Nucleus gelatinous, colourless. Perithecium sub-ceraceous. Paraphyses slender, flexuose. Asci ventricoso-fusiform. Spores innumerable, minute, ellipsoid, colourless, with an indistinct nucleus at each extremity.

1. *T. Laureri*, (Flot.) *brownish-grey*, crustaceous, somewhat furfuraceous, thin or evanescent; apothecia scattered, *minute*, *granuloso-verrucose*, of a *citrine*-yellow-colour, ostiolum slightly depressed, inconspicuous; *spores numerous*, minute, colourless, *ellipsoid*, obsoletely polari-nucleolate.

On larch rails, rare. 1864.

SYN :—Nyl. Lich. Alger. p. 338. (1854.) Leight. in Ann. and Mag. N. Hist. Dec. 1864.
FIG :—Ann. and Mag. Nat. Hist. 1864. t. 9. f. 1. 2. 3. 4. 5.
EXS :—Leight. 351.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Arkoll Hill! Shropshire. *Mr. W. Phillips.* Middletown! Shropshire. (1864); Cemetery near Shrewsbury! Stableford! near Bridgnorth, Shropshire.
Spores .006 mm. long, .003 mm. broad.

2. *T. epithallinum*, Leight. *parasitic* on the thallus of *Bæomyces rufus*; *apothecia* scattered, *minute*, *granuloso-verrucose*, *flavo-virescent*; *spores numerous*, minute, colourless, *oblong or cylindraceo-oblong.*

Parasitic on Bæomyces rufus, very rare. 1864.

SYN :—Leight. in Ann. and Mag. Nat. Hist. July 1866. Nyl. in Flora Oct. 1866. p. 420.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Stiperstones Hill! Shropshire. (1864.)
Spores .006—7 mm. long, .0020—.0025 mm. broad.

3. *T. intermediellum*, Nyl. yellowish-green, thin, often evanescent; apothecia yellowish-green, small, scattered or crowded, *globoso-depressed and umbilicate*; spores innumerable, very minute,

colourless, oblong, obtuse and incrassate at the apices ; paraphyses none ; filamenta ostiolaria minute, ramose, or fasciculate ; gelatina hymenea I vinoso-fulvescent.

On old wood, leather, &c., rare. 1873.

SYN :—Nyl. in Flora 1865. p. 260. Phillips in Grevillea 2. p. 125.
FIG :—Grevillea l. c. t. 21.
GEOG. DISTRIB :—Finland, England.
BOT. PROV :—5.
ENGLAND :—On an old leathern shoe, Hancott Pool near Shrewsbury! Berrington. *Mr. W. Phillips.* (1873.)
"Spores .0035—.0050 mm. long, .0020 mm. broad." (*Nyl.*)

4. *T. superellum*, Nyl. externally similar to the preceding species, but *apothecia much larger* ; spores innumerable, colourless, ellipsoid ; paraphyses slender, elongate, straight ; gelatina hymenea I—, but the thecæ bright-blue.

On decaying Jungermanniæ, rare. 1874.

SYN :—Nyl. in Flora 1865. p. 261.
GEOG. DISTRIB :—E. Lapland.
BOT. PROV :—7.
WALES :—Trefriw ! *Mr. W. Phillips.* (1874.)
"Spores .009—.012 mm. long, .0045 mm. broad." (*Nyl.*)

## II. NORMANDINA, *Nyl.*

Thallus squamose or squamulose, squamulæ thin, rotundate. Apothecia black, immersed.

1. *N. lætevirens*, Turn. & Borr. *læte-virescent*, squamulose, membranaceous, *squamules orbicular*, sinuate and rotundato-lobate, imbricated, adnate, regularly and deeply concave, margins upturned and thickened or inflexed, *naked and whitish beneath* ; apothecia unknown.

On moist earth frequent. 1810.

SYN :—*Verrucaria*, Turn. & Borr. E. Bot. Suppl. 2658. *Endocarpon viride*, Ach. L. U. 300. Syn. 100. *Endocarpon lætevirens*, Leight. Ang. Lich. 12. *Normandina*, Nyl. Scand. 264. Mudd Man. 269.
FIG :—E. Bot. Suppl. 2658.
EXS :—Leight. 25. Mudd 258. Anzi It. S. 355.
GEOG. DISTRIB :—Europe, Lapland, N. America.
BOT. PROV :—1, 2, 3...5...7...10...12...15...19...30, 31.
ENGLAND :—Esher, Surrey. *Mr. Turner.* Black Down, Sussex ; Tunbridge Wells. *Mr. Borrer.* Mynydd-y-Myfyr ! Oswestry, Shropshire. *Rev. T. Salwey.* Cumberland. *Mrs. Stanger.* Battersby Bank and Ingleby Moor ! Cleveland. *Mr. Mudd.* Devonshire ! *Hook. Herb.* Carn Galva ! near Penzance. *Mr. Curnow.* Hungershall Rocks, Tunbridge Wells. *Mr. Holmes.* Stiperstones Hill ! Caradoc ! Shropshire.
SCOTLAND :—Ben Lawers. *Dr. Maingay.*
IRELAND :—Doneraile Mountains ; Mangerton, Kerry. *Mr. Carroll.* near Belfast. *Mr. Templeton.* near Bantry. *Miss Hutchins.* Carig Mountain and Dunkerron. *Dr. Taylor.*
WALES :—Aran Mowddwy ! Merionethshire. *Mr. Borrer.* Cader Idris, Llyn Ogwen. *Mr. Holmes.* Cwm Bychan ! Cwm Ffynnon Llugwy ! Sychnant ! near Conway ; Cell Fawr ! Barmouth.
CHANNEL ISLANDS :—Quenvais, Jersey. *Mr. Larbalestier.*

2. *N. pulchella*, Borr. *glaucous or greenish-grey*, membranous, squamulose, *squamules orbicular*, concave, rotundate or rotundato-lobate, adnate, *concentrically wrinkled*, margin upturned, thickened or inflexed, *frequently sorediate, pale-brown and tomentose beneath* ;

apothecia immersed in thalline tubercles, perithecium entire, black; spores 8, colourless, lineari-cylindrical, 7-septate.

On mossy trees, not common.

SYN :—*Verrucaria*, Borr. in E. Bot. Suppl. 2602. (1829.) *Endocarpon*, Leight. Ang. Lich. 13. *Normandina*, Nyl. Prodr. 173. Mudd Man. 268.

FIG :—E. Bot. Suppl. 2602. f. 1. Leight. Ang. Lich. t. 3. f. 1.

EXS :—Leight. 367. Zw. 245. Larbal. 93. Nyl. 89. Mass. 339.

GEOG. DISTRIB :—France, Germany, Austria, Italy, N. Zealand, Mexico, Asia.

BOT. PROV :—1, 2...7...15...19...30, 31.

ENGLAND :—Sussex! *Mr. Borrer*. Appuldercombe, Isle of Wight; Beeding Priory! Sussex. *Rev. A. Bloxam*. Launceston, Cornwall. *Rev. J. M. Crombie*. Tilgate Forest, Sussex. *Mr. Larbalestier*. Plymouth. *Mr. Holmes*.

SCOTLAND :—Killin and Lochaber. *Rev. J. M. Crombie*.

IRELAND :—Ballymartle! co. Cork. *Mr. Carroll*. near Bantry. *Miss Hutchins*. Tollymore Park, co. Down. *Dr. Maingay*. Kerry. *Adm. Jones*. Ballinahinch! near Letterfrack! *Mr. Larbalestier*.

WALES :—Barmouth! *Rev. T. Salwey*. Rhewgreidden. *Rev. A. Bloxam*. Llyn Aran! Cader Idris.

CHANNEL ISLANDS :—Guernsey; St. Peter's Valley, Rozel! La Moye! Jersey. *Mr. Larbalestier*.

"Spores .026– 40 mm. long, .006—7 mm. broad." (*Nyl.*) Spores .034—.035 mm. long, .008 mm. broad.

## III. ENDOCARPON, *Hedw. Nyl.*

Thallus peltate or squamæform or areolate. Apothecia with a pale rarely infuscate perithecium. Paraphyses none. Spores 8, colourless, oblongo-ellipsoid, simple.

1. *E. miniatum*, (L.) *cinereous or cinereous-white, simple*, firm, coriaceous, *peltate*, umbilicato-affixed, *large, expanded, rotundato- or undulato-crenato-lobate, smooth or minutely albo-granuloso-pruinose*, under surface smooth or rugulose, fulvous; apothecia minute, very numerous, imbedded; epithecium slightly elevated, brown; spores 8, colourless, oblong or ellipsoid, simple.

On sub-alpine rocks, frequent. 1741.

SYN :—*Lichen*, Linn. Sp. Pl. 50. (1762.) *Endocarpon*, Ach. Syn. 101. Leight. Ang. Lich. a. 11. Nyl. Scand. 265. Mudd Man. 265.

FIG :—E. Bot. 593. (2 upper fig.) Leight. Ang. Lich. t. 1. f. 4.

EXS :—Leight. 26. Anzi It. S. 356. Hepp 218. a. 666. Larbal. 94. Mass. 6. Mudd 255. Schær. 112. M. & N. 57. Bohl. 1. Welw. Lusit. 24. Smrft. 29.

GEOG. DISTRIB :—France, Pyrenees, Portugal, Sweden, Hungary, Italy, Germany, Austria, Algeria, N. America.

BOT. PROV :—1...5, 6, 7, 8...10, 11...17, 18...(19—30)...31.

ENGLAND :—Cheddar rocks, co. Somerset. *Dillenius*. (1741.) Saxton's bath, Matlock. *Sir J. E. Smith*. Tor near Wells, co. Somerset. *Mr. Littleton Brown*. St. Vincent's Rocks! *Mr. Borrer*. Craig-y-Rhiw! near Oswestry, Shropshire, *Rev. T. Salwey*. Rokeby! Durham. *Mr. Mudd*. Hilks Wood, Ingleborough. *Dr. Carrington*. near Settle. *Dr. Windsor*. Gunner's Pool in Castle Eden Dene Stanhope-in-Weardale; Middleton-in-Teesdale; Eglestone, Durham. *Mr. Winch*. Bradley Woods; Newton, Devon. *Mr. Parfitt*. Chudleigh, Devon; Druidical Stones at Staunton Drew. *Mr. Percival*. Lynton, Kent. *Mr. Holmes*. Salisbury. *Dr. Flugge*. Tintagel Castle. *Hook Herb*.

SCOTLAND :—Craig Guie, Braemar; Dunottar Castle, Kincardineshire. *Rev. J. M. Crombie*. Rosshire. *Mr. Croall*. Forfarshire. *Hook. Herb*.

IRELAND :—On dry limestone rocks, frequent. *Mr. Carroll*.

WALES :—Barmouth. *Rev. T. Salwey*. Hisvac; Llanfaethly, Anglesea. *Messrs. Brewer & Green*. Langer! S. Wales. *Rev. J. F. Crouch*. Tenby, Pembrokeshire. *Miss Attwood*. Puffin Island, Anglesea. *Rev. A. Bloxam*. Diganwy! near Conway; Criccieth Castle! Harlech Castle!

CHANNEL ISLANDS :—L'Etacq ; La Moie ; Beauport ; Rozel Tower, Jersey ! Jerbourg, Guernsey. *Mr. Larbalestier.*

"Spores .00275 to .00325 in. long, by .00125 in. broad. Spermatia cylindrical, straight." (*Mudd.*) "Spores .015—18 mm. long, .006—.010 mm. broad." (*Nyl.*) Spores .011—.013 mm. long, .006—.007 mm. broad.

Var. *complicatum*, (Sw.) *densely cæspitose, polyphyllous, lobes ascending, imbricate and complicate, sub-pruinose*, greyish, *margins rotundate, erect, blackish.*

On moist and wet rocks, frequent. 1741.

SYN :—Swartz Nova Act. Upsal. 4. p. 38. (1744.) Ach. Syn. 102. Nyl. Scand. 265. Leight. Ang. Lich. 11. Mudd Man. 265.

FIG :—E. Bot. 593. lower fig. Leight. Ang. Lich. t. 2. f. 1.

EXS :—Leight. 167. Mudd 256. Hepp 667. Anzi It. S. 357. Breutel 303. Schær. 113. Mass. 164. Arn. 605.

GEOG. DISTRIB :—France, Switzerland, Pyrenees. Italy, Germany, Hungary.

BOT. PROV :—1...5, 6. 7...10, 11 ..(19—30.)

ENGLAND :—Yorkshire. *Mr. Salt.* St. Vincent's Rocks. *Mr. Borrer.* Shropshire ! *Rev. T. Salwey.* Falcon Clints ! Teesdale. *Mrs. Stanger.* Moreton ; North Bovey ; Tor of Dartmoor ; Hightor Rock, Devon. *Messrs. Jones & Kingston.* Penpole Point ! near Shirehampton. *Mr. Percival.*

SCOTLAND :—Craig Guie, Glen Lochay. *Rev. J. M. Crombie.*

IRELAND :—On rocks in streams, frequent. *Mr. Carroll.*

WALES :—Near Perfeddgoed House, Bangor. *Mr. Brewer.* (1741.) Ffynnon Cwm y Gof, Radnorshire. *Mr. Littleton Brown* ; Gimlet Rock ! Pwllheli ; Cwm Ffynnon Lugwy !

Spores .0135—.015 mm. long, .006—.007 mm. broad.

Var. *leptophyllum*, Ach. *dark-brown, small*, peltate, rounded, lobed and wavy, smooth, nigro-fuscous beneath.

On alpine rocks, rare.

SYN :—Ach. Prodr. 141. (1798.) Nyl. Scand. 265. Leight. Ang. Lich. 12. Mudd Man. 266.

FIG :—E. Bot. 2012. f. 2. Leight. Ang. Lich. t. 2. f. 2.

GEOG. DISTRIB :—Europe.

BOT. PROV :—7...12...16...19...29, 30.

ENGLAND :—Rocks by Bassenthwaite Water, Cumberland. *Mr. Robertson.*

SCOTLAND :—Shore of Loch Lomond near Tarbet ! *Mr. Borrer.*

IRELAND :—Near Bantry. *Miss Hutchins.* frequent in the northern counties. *Dr. Moore.*

WALES :—Llyn Bodlyn ! Glaslyn ! Snowdon. *Mr. Borrer.* Llyn Gwernan, Llyn Howel and Llyn Bodlyn. *Rev. T. Salwey*, Bala Lake. *Mr. Holmes.* Trefriw !

"Spores .0025 to .003. in. long, by .0015 in. broad." (*Mudd.*) Spores .016 mm. long, .009 mm. broad.

2. *E. fluviatile*, (D.C.) *lurido-fuscescent, polyphyllous, cæspitose, lobes tumid* and bullate, crenate or inciso-crenate, *strongly recurved*, smooth or albo-granuloso-pruinose above, nigro-fuscous beneath.

On rocks in sub-alpine streams and lakes, rare. 1799.

SYN :—D. C. Fl. Fr. 2. 413. (1805.) Nyl. Scand. 265. Mudd Man. 266.

FIG :—E. Bot. 594.

EXS :—Anzi Langob. 217. Larbal. 95. Fellm. 211. M. & N. 152. Schær. 114.

GEOG. DISTRIB :—Sweden, E. Lapland, Pyrenees, Italy, Germany, Hungary, N. America.

BOT. PROV :—1...6, 7...11...15, 16...22...26...29...31.

ENGLAND :—River Tees near Eglestone, Durham. *Rev. J. Harriman.* River Teign, Devon. *Mr. Parfitt.* Erne, Devon. *Rev. J. M. Crombie.* Dartmoor. *Mr. Holmes.*

SCOTLAND :—Ben. Lawers ! *Herb. Hooker.* Mountain Streams ! *Mr. Borrer.* Appin ; Craigforth near Stirling ; Loch Lomond ; Loch Linnhe. *Rev. J. M. Crombie.*

IRELAND :—Knockcurris, Innishowen. *Mr. Brown.* Luggelwa, Wicklow. *Adm. Jones.* Dargle. *Dr. Stokes.* Dawros river! co. Galway. *Mr. Larbalestier.*

WALES :—Hafod, Cardiganshire. *Sir J. E. Smith.* (1799.) Llyn Gwernan! Cader Idris; Bettws-y-coed! Cwm Ffynnon Lloer! Harlech Castle!

CHANNEL ISLANDS :—Boulay Bay; East Coast of Jersey! Saints Bay, Guernsey. *Mr. Larbalestier.*

"Spores .0025 to .003 in. long, by .00125 in. broad." (*Mudd.*) Spores .015-.017 mm. long, .007 mm. broad.

Var. *euplocum*, Ach. greyish-brown, *minute*, *monophyllous*, umbilicate, *deeply laciniato-lobate*, *margins* crisped and *recurved*.

On maritime rocks, rare.

SYN :—Ach. L. U. 301. (1810.) Nyl. Scand. 265. Leight. Ang. Lich. 12. Mudd Man. 266.

FIG :—E. Bot. Suppl. 2602. f. 2. Leight. Ang. Lich. t. 2. f. 3.

GEOG. DISTRIB :—Sweden.

BOT. PROV :—11.

ENGLAND :—On the shore of the Tyne! near Newcastle. *Mr. Robertson.*

Spores .010—.012 mm. long, .006—.007 mm. broad.

3. *E. rufescens*, Ach. *rufescent*, squamose, *squamulæ rotundate, incised, undulato-flexuose, adnate, sub-imbricate and complicate, margins thickened, repando-lobulate;* spores 8, colourless, oblong, simple.

On the earth among mountain rocks, rare.

SYN :—Ach. L. U. 304. (1810.) Nyl. Scand. 265. Mudd Man. 267.

FIG :—Hepp Sporen t. 24. f. 219.

EXS :—Zw. 22. Anzi Langob. 219. Schær. 465. Mass. 188. Hepp 219. Bohl. 75.

GEOG. DISTRIB :—Germany, France, Switzerland, Italy, Norway, Austria, Hungary, New Zealand, Africa.

BOT. PROV :—1. 2...5...7, 8...14, 15...19...30.

ENGLAND :—Horsham Church! Sussex. *Mr. Borrer.* Charnwood Forest. Leicestershire; Clifton near Bristol. *Rev. A. Bloxam.* Plymouth. *Mr. Holmes.* Torquay. *Hook. Herb.* Llanymynech Hill! Norton Camp! Shropshire.

SCOTLAND :—Ben Lawers! Arthur's Seat; Hill of Kinnoul. *Hook. Herb.* Ben Ledi; Craig Tulloch; Craig Guie. *Rev. J. M. Crombie.*

IRELAND :—Carig Mountain, Kerry. *Dr. Taylor.* Cave Hill. Belfast. *Dr. Moore.*

WALES :—Arthur's Table, Anglesea. *Rev. A. Bloxam.* Eglwyseg rocks!

"Spores .0035 to .004 in. long, by .00125 to .0015 in. broad." (*Mudd.*) "Spores .013—18 mm. long, .008 mm. broad." (*Nyl.*)

f. *lachneum*, Ach. *fusco-virescent*, squamose, *squamulæ rotundate, sub-incumbent*, flexuose, *slightly tumid, margin sub-crenate, free.*

On earth in mountain regions, rare.

SYN :—Ach. L. U. 299. (1810.) Leight. Ang. Lich. p. 14.

FIG :—E. Bot. 1698. & 2012. f. 1. Leight. l. c. t. 3. f. 2.

EXS :—Fries 355. M. & N. 442. Mass. 189. Mudd 257. Anzi Langob. 218. Arn. 169.

GEOG. DISTRIB :—Sweden, Russia, France, Switzerland, Italy, Swan River.

BOT. PROV :—5, 6, 7...15.

ENGLAND :—Blodwel Rocks! Shropshire. *Rev. T. Salwey.* Cheddar; St. Vincent's rocks! *Mr. Borrer.*

SCOTLAND :—Hill of Kinnoul near Perth. *Messrs. Hooker & Borrer.*

WALES :—Tenby Castle! Pembrokeshire. *Mr. Mudd.* Llandudno! Carnarvonshire.

Spores .010—.0115 mm. long, .006 mm. broad.

4. *E. hepaticum*, Ach. *rufo-fuscescent or fuscous*, squamose, *squamulæ round or angular, simple, more or less dispersed, adnate, plane, margin entire, elevated and nigricant;* spores 8, colourless, oblong, simple.

On earth and on walls, rare. 1794.

SYN:—Ach. L. U. 298. (1810.) Nyl. Scand. 265. *E. Hedwigii*, Leight. Ang. Lich. 14.
FIG:—E. Bot. 595. Leight. l. c. t. 3. f. 3.
EXS:—Nyl. 87. Schær. 115. Hepp 220. M. & N. 441. Leight. 135.
GEOG. DISTRIB:—France, Italy, Switzerland, Germany, Africa, N. America.
BOT. PROV:—1, 2...4, 5, 6, 7...11...15. 16...19.
ENGLAND:—Near Croydon. *Mr. Dickson.* (1794.) Norfolk. *Mr. Turner.* Sussex Downs! *Mr. Borrer.* Newmarket Heath! *Rev. T. Salwey.* Chance's Pitch! Malvern Hills. *Mr. Lees.* Penzance. *Rev. J. M. Crombie.* Eglestone, Durham. *Rev. J. Harriman.* Plymouth. *Mr. Holmes.* Blackstone Rock, Devon. *Dr. Dickie.* Wall of Moor Park, near Ludlow!
SCOTLAND:—Ben Nevis. *Herb. Hook.* Killin and Appin. *Rev. J. M. Crombie.*
IRELAND:—Dunkerron, Kerry. *Dr. Taylor.* Lota, Cork. *Mr. Carroll.*
WALES:—Dolgelley. *Dr. Holl.* between Barmouth and Borthwen, and Cader Idris. *Mr. Ralfs.* Tenby!
"Spores .011—14 mm. long, .006—7 mm. broad." *(Nyl.)* Spores .012—.015 mm. long, .006—.008 mm. broad.

f. *exiguum*, Nyl. pale or *pale-yellowish*, squamose, squamulæ *small, closely adnate, very thin*, rotundate, scattered.

On earth, rare.

SYN:—Nyl. Prodr. 176.
EXS:—Nyl. 88. Mass. 161. Zw. 403.
GEOG. DISTRIB:—France, Germany, Switzerland, Italy.
BOT. PROV:—10...31.
ENGLAND:—Sutton Bank! near Thirsk, Yorkshire. *Mr. Baker.*
CHANNEL ISLANDS:—Beauport Bay! Jersey. *Mr. Larbalestier.*
"Spores. 010—13 mm. long, .0055 mm. broad." (*Nyl.*)

## IV. VERRUCARIA, *Pers. Nyl.*

Thallus mucoso-gelatinous, or continuous and smooth, or rimuloso-areolate, or areolato-diffract, or pulverulent, or squamulose, or evanescent. Apothecia pyrenodine, perithecium black, rarely pale or coloured, entire or dimidiate, semi-immersed or sessile. Spores 2, 4, 8, or numerous, simple or variously septate, or locular, colourless or fuscous.

### A. *Spores simple.*

#### * *Thallus mucoso-gelatinous.*

1. *V. mucosa*, Whlnb. *olivaceo-or nigro-virescent, mucoso-gelatinous*, smooth, *continuous*, thickish, diffuse or frequently in orbicular zonate patches; *apothecia* black, *very minute, punctiform, innate and immersed, scarcely prominent above the thallus; ostiolum* appearing only as a *thin, circular black ring* surrounding the *large depressed, umbilicate epithecium;* perithecium dimidiate; paraphyses none; spores 8, colourless, minute, lineari-ellipsoid, simple, frequently polari-nucleolate; gelatina hymenea yellowish-red with iodine.

On maritime rocks, not frequent.

SYN:—Whlnb. in Ach. Meth. Suppl. 23. (1803.) Nyl. Scand. 275.
EXS:—Th. M. Fries 75.
GEOG. DISTRIB:—Sweden, Lapland, Norway.
BOT. PROV:—13, 14...16...19...23...26...30, 31.

SCOTLAND :—Ardrossan. *Dr. Landsborough.* (1851.) Newhaven ! near Leith. *Dr. Greville.* Ardrishaig ! Argyleshire. *Dr. Lindsay.*
IRELAND :—Woburn, co. Down ! *Adm. Jones.* Howth. *Dr. Moore.* Cork coast. *Mr. Carroll.* Killeray Bay ! Connemara. *Mr. Larbalestier.*
CHANNEL ISLANDS :—South coast of Jersey ! *Mr. Larbalestier.*
"Spores .008—010 mm. long, .006 mm. broad." (*Nyl.*) Spores .010—.014 mm. long, .005 mm. broad.

2. *V. halophila*, Nyl. *olivaceo-virescent or nigricanti-virescent, mucoso-gelatinous, thin, continuous*, smooth, effuse or macular; *apothecia black and shining*, numerous, crowded, moderate, *hemispherico-globose*, somewhat truncate, *sessile*, immersed only at the base ; *epithecium regularly poriform, or more or less dilated and depressed ;* perithecium dimidiate ; paraphyses none ; spores 8, colourless, very minute, ellipsoid, simple, generally with 2 nuclei ; gelatina hymenea red with iodine.

On maritime rocks, frequent. 1851.

SYN :—Nyl. Chil. 175. (1859.) Prodr. 185. *V. aquatilis*, Mudd. *V. Whichcotii*, Larbal.
EXS :—Larbal. 100. Mudd 270. 271. Leight. 33. in part.
GEOG. DISTRIB :—France, Normandy, Chili.
BOT. PROV :—6, 7...10...14...30, 31.
ENGLAND :—Near Ayton ! Cleveland ! Black Rocks ! near Hartlepool. *Mr. Mudd.*
SCOTLAND :—Newhaven ! near Leith, Edinburgh. *Dr. Greville.* (1851.)
IRELAND :—Woburn, co. Down. *Adm. Jones.*
WALES :—Black Stones ! Conway Bay ; Manorbeer ! Goodwick Bay ! Tenby !
CHANNEL ISLANDS :—St. Aubin's Bay ; Grevè-au-Lançon ! Jerbourg ! Guernsey. *Mr. Larbalestier.*
Spores .006—.009 mm. long, .003 mm. broad. *V. leptotera*, Nyl. in Flora 1865. p. 212. according to specimens from Mr. Larbalestier is only a state of *V. halophila.*

3. *V. striatula*, Whlnb. *black or nigro-virescent, mucoso-gelatinous*, thin, effuse, *effigurato-dendritic*, consisting of small elevated difformed, distinct, convex, branched, dendritico-radiant lines ; *apothecia* black and polished, minute, *sessile, sub-globose, truncate ; epithecium large, depressed, umbilicate ;* perithecium dimidiate ; paraphyses none ; spores 8, colourless, very minute, ellipsoid or oblong, simple ; gelatina hymenea vinous-red with iodine.

On maritime rocks, rare. 1865.

SYN :—Whlnb ! in Ach. Meth. Suppl. 21. (1803.) Nyl. Scand. 274.
GEOG. DISTRIB :—Norway, Lapland.
BOT. PROV :—31.
CHANNEL ISLANDS :—Caves at Grève-au-Lançon ! ; Pliémont ! ; Noirmont, Jersey ; under Fort Essex, Alderney ! *Mr. Larbalestier.* (1865.)
"Spores ,008 mm. long, .004 mm. broad." (*Nyl.*) Spores .008—.0095 mm. long, .004—.005 mm. broad.

4. *V. microsporoides*, Nyl. similar to *V. mucosa* but with larger spores ; perithecium nearly entire or dimidiate.

On wave-washed maritime rocks, rare. 1865.

SYN :—Nyl. Lich. Armor. in Bull. Soc. Bot. Franc, 8. p. 759 (1861.) Carroll in Seem. Journ. Bot. 3. 293.
GEOG. DISTRIB :—France.
BOT. PROV :—24...30, 31.
IRELAND :—Glenarm and Garron Point, co. Antrim. *Adm. Jones.* (1865.) Kilkee, co. Clare. *Mr. Carroll.*
CHANNEL ISLANDS :—Coast of Alderney ! *Mr. Larbalestier.*
Spores .014—.015 mm. long, .008—.0085 mm. broad.

5. *V. epigœa*, (Pers.) *pale-brown, grey or yellowish-green, mucoso-gelatinous when moist, subleprose when dry*, thin, sub-effuse; *apothecia* black, *immersed*, globose or subampullæform, minute; ostiolum nearly flat, slightly dilated; epithecium poriform; *perithecium entire, upper portion thicker*; spores 8, colourless, irregularly obovate or oblong or oblongo-ellipsoid, simple.

On the earth, frequent. 1806.

SYN:—*Sphæria*, Pers. Syn. Fung. App. 27. (1801.) *Verrucaria*, Ach. Meth. 123. L. U. 295. Syn. 96. Nyl. Scand. 276. Leight. Ang. Lich. 64. Mudd Man. 293.

FIG:—E. Bot. t. 1681. Leight. Ang. Lich. t. 27. f. 4.

EXS:—Fries 246. (fide Nyl.) Schær. 106. Anzi It. S. 379.

GEOG. DISTRIB:—Sweden, Switzerland, Scandinavia, Lapland, Italy, France.

BOT. PROV:—2...4, 5...7, 8...11...19...23, 24...30.

ENGLAND:—Norwich. *Rev. G. R. Leathes.* (1806.) Sussex! *Mr. Borrer.* Hay Coppice! Herefordshire. *Rev. T. Salwey.* Twycross! Leicestershire. *Rev. A. Bloxam.* Teesdale, Durham. *Rev. J. Harriman.* Northumberland and Durham. *Mr. Winch.* near Cirencester. *Mr. W. Joshua.*

IRELAND:—Belfast. *Mr. Templeton.* Killiney near Dublin. *Dr. Taylor.* near Bantry. *Miss Hutchins.* Ross, co. Clare. *Mr. Carroll.*

WALES:—Dolgelley. *Dr. Holl.*

"Spores .004 to .005 in. long, by .0015 in. broad." (*Mudd.*) "Spores .020—27 mm. long, .007—.011 mm. broad." (*Nyl.*) Spores .022—.025 mm. long, 085—.010 mm. broad.

** *Thallus continuous, smooth.*

6. *V. Dufourei*, D.C. *grey or smoky-brownish-grey*, thin, tartareous, continuous, smooth, determinate; *apothecia black*, and more or less polished, numerous, scattered or confluent, *hemispherical, prominent, truncate; epithecium large*, depressed, open or *umbilicate; perithecium dimidiate, much incurved*, inner tunic very thin, black; paraphyses none; spores 8, colourless, oblong, simple; gelatina hymenea red with iodine.

On calcareous rocks, frequent. 1830.

SYN:—D.C. Fl. Fr. 2. 318. (1805.) Leight. Ang. Lich. 76. Mudd Man. 290. *V. concinna*, Borr. E. B. Suppl. 2623. Leight. Ang. Lich. 50.

FIG:—E. Bot. Suppl. t. 2623. f. 1. Leight. Ang. Lich. t. 22. f. 3.

EXS:—M. & N. 953. Schær. 101. Anzi It. S. 378. Anzi Venet. 152. Mass. 212

GEOG. DISTRIB:—France, Switzerland, Pyrenees, Italy, Hungary.

BOT. PROV:—2...5...7...10, 11, 12...19...30.

ENGLAND:—Durham. *Mr. Robertson.* (1830.) near Eglestone! Durham; Sussex Downs! *Mr. Borrer.* Maze Beck! Westmoreland! *Mr. Robertson.* Cullercoats, Cumberland. *Mr. Lisle.* Helks Wood, Ingleborough. *Dr. Carrington.* Hartlepool, Durham. *Mr. Mudd.* Bexley Common, Gloucestershire. *Mr. Joshua.*

IRELAND:—Kerry. *Dr. Taylor.* Glenarm and White Park, co. Antrim. *Dr. Moore*, Kenmare. Kerry; Middleton, near Cork. *Mr. Carroll.* Lough Derryclare! *Mr. Larbalestier.*

WALES:—Eglwyseg rocks! near Llangollen.

"Spores .003 to .0045 in. long, by .00125—.002 in broad." (*Mudd.*) Spores .017—.019 mm. long, .0085 mm. broad.

7. *V. margacea*, Whlnb. *olive-brown or cinereo-fuscescent*, crustaceous, sub-membranaceous, thin, *smooth*, somewhat shining, *continuous or sub-rimulose*, effuse or determinate; *apothecia concolorous, covered by, and immersed in thalline elevations*, the *minute* black apices or *ostiola only visible*; epithecium poriform; *perithecium* black, *dimidiate*; paraphyses none; spores 8, colourless, ellipsoid or oblong, simple, large; gelatina hymenea vinous-red with iodine.

On wet rocks, frequent. 1833.

SYN :—*Thelotrema*, Whlnb. in Ach. Meth. Suppl. 30. (1803.) *Verrucaria*, Whlnb. Lapp. 465. Nyl. Scand. 272.
FIG :—E. Bot. Suppl. t. 2768. Hepp Sporen t. 12. f. 95.
EXS :—Schær. 521. Arn. 421. Anzi It. S. 368. Hepp 95.
GEOG. DISTRIB :—Sweden, Switzerland, Bavaria, Germany, Italy.
BOT. PROV :—1, 2, 3...6, 7...11...14...19...24—26...30, 31.
ENGLAND :—Hind Head; near Abinger, Surrey; above Rundhurst at foot of Black Down; in Harting Comb; and Edburton, Sussex. *Mr. Borrer.* (1833.) North of England. *Mr. Woods.* near Dartmouth, Devon. *Mr. Parfitt.* Symond's Yatt. *Mr. W. Joshua.* Long-mynd! Shropshire.
SCOTLAND :—Habishow near Edinburgh. *Dr. Maingay.* Morrone; Glen Tilt. *Rev. J. M. Crombie.*
IRELAND :—Bantry. *Miss Hutchins.* Barclay's Rock, co. Down. *Adm. Jones.* Kilkee, Clare; Ballinhassig, Cork; and on Caher, Mc Gillicuddy's Reeks; Blackwater Bridge, Kerry. *Mr. Carroll.* Ardglass co. Down. *Dr. Maingay.* near Westport! co. Mayo. *Mr. Larbalestier.*
WALES :—Trefriw falls! Capel Arthog!
CHANNEL ISLANDS :—Noirmont and St. Ouen's, Jersey! Jerbourg, Guernsey. *Mr. Larbalestier.*
"Spores .024—35 mm. long, .010—.016 mm. broad." *(Nyl.)* Spores .026 mm. long, .014 mm. broad.

Var. *æthiobola*, Whlnb. similar to the type, but the *ostiola* of the apothecia are *more denuded*, black; the *apothecia prominent, and only immersed at the base;* epithecium larger, depressed, umbilicate; spores much smaller.

On wet rocks, frequent.

SYN :—Whlnb. in Ach. Meth. Suppl. 17. (1803.) Lapp. 465. Nyl. Scand. 272.
FIG :—Hepp Sporen t. 11. f. 94.
EXS :—Paler thallus :—Hepp 94. Arn. 51. Zw. 29. Leight. 34. Schær. 590.
Rufo-fuscescent thallus :—Fellm. 215. 216. Schær. 522. Anzi Langob. 245. Hepp 689. Zw. 212.
GEOG. DISTRIB:—France, Switzerland, Germany, Hungary, Italy, Bavaria, E. Lapland.
BOT. PROV :—2...5...7...10...19...26...31.
ENGLAND :—Isle of Wight! *Rev. T. Salwey.* Cleveland Lodge! *Mr. Baker.* near Ayton, Cleveland. *Mr. Mudd.* Downton Castle Woods! Shropshire.
IRELAND :—Blackwater Bridge and Dunkerron. *Dr. Taylor.* Curraghmore. *Adm. Jones.* Connor Cliffs and Caher, Kerry; Ballinhassig Glen, Cork. *Mr. Carroll.* near Letterfrack! Lettermore! *Mr. Larbalestier.*
WALES :—Pen Trwyn! Great Orme's Head.
CHANNEL ISLANDS :—Rozel Bay! Jersey. *Mr. Larbalestier.*
It is often difficult to separate this variety from the type, and its differences seem to consist principally, so far as external character, in the ostiola of the prominent apothecia being more denuded. *V. hydrela* seems identical. There are two states, one in which the thallus is pale-brown like the type, the other in which it is fuscescent or rufo-fuscescent. Paler thallus :—Spores .017—.027 mm. long, .006—.013 mm. broad. Rufo-fuscescent thallus :—Spores .016—.031 mm. long, .009—.015 mm. broad. "Spores .014—24 mm. long, .007—.010 mm. broad." *(Nyl.)*

Var. *papillosa*, Ach. *pale-greyish-brown*, subtartareous, rugulose, continuous or *rimulose; apothecia large*, hemispherical, truncate, *semi-immersed in thalline elevations; ostiolum black, denuded;* epithecium poriform, large, impressed; spores larger than in var. *æthiobola.*

On rocks, rare.

SYN :—Ach. L. U. 286. (1810.) Leight. Ang. Lich. 54.
FIG :—Leight. Ang. Lich. t. 24. f. 1.
EXS :—Zw. 361.
GEOG. DISTRIB:—Switzerland, Germany.

Bot. Prov :—1...3...11...19.
England :—Hartlepool, Durham. *Mr. Mudd.* Mary Church, Torquay. *Mr. Parfitt.* Inworth, Essex. *Mr. Varenne.* Saltash, Devon. *Mr. Holmes.*
Ireland :—Dunkerron Mountain ! *Dr. Taylor.*
Spores .022—.0235 mm. long, .011—.012 mm. broad.

Var. *acrotella*, Ach. pale-brown or greyish-brown or blackish, thin, continuous or evanescent; apothecia black, minute, prominent, hemispherical; perithecium dimidiate; spores of the same size as those of *æthiobola*.

On stones, not common.

Syn :—Ach. Meth. 125. (1803.) Nyl. Scand. 293. *V. mutabilis*, Borr. Leight. Ang. Lich. 55. in part.
Fig :—E. Bot. t. 1712.
Exs :—Arn. 53. 102.
Geog. Distrib :—Sweden, Germany.
Bot. Prov :—1, 2...10, 11...19...30.
England :—Sussex ! *Mr. Borrer.* near Ayton. *Mr. Baker.* Teesdale and Weardale, Durham. *Mr. Winch.* Rora Down near Ilsington, Devon. *Messrs. Jones & Kingston.*
Ireland :—Near Bantry. *Miss Hutchins.* near Belfast. *Mr. Templeton.* Carig and Dunkerron, Kerry, *Dr. Taylor.* Ballinhassig, Cork. *Mr. Carroll.*
Spores .017—.019 mm. long, .0085—.0095 mm. broad.

8. *V. devergescens*, Nyl. "Allied to *V. æthiobola*. Spores lineari-oblong, .019—29 mm. long, .007—.010 mm. broad." *(Nyl.)*

On maritime rocks, 1877.

Syn :—Nyl. in Flora 1877 p. 462.
Bot. Prov :—26.
Ireland :—Near Letter ! co. Galway. *Mr. Larbalestier.* (1877.)
Spores .016—.018 mm. long, .008—.009 mm.

9. *V. latebrosa*, Körb. *reddish-smoke-colour*, effuse, thinly tartareous; *rimuloso-areolate; apothecia nigro-fuscous*, large, globose, sessile, *more or less covered at the base by the thallus;* epithecium poriform; *spores* 2, colourless, at length slightly brown, large, ellipsoid, simple.

On rocks, rare. 1877.

Syn :—Körb. Syst. 349. (1855.) Par. 377.
Exs :—Arn. 607.
Geog. Distrib :—Germany.
Bot. Prov :—26.
Ireland :—Kylemore Lake ! *Mr. Larbalestier.* (1877.)
Spores .0255 mm. long, .011 mm. broad. Korber says "spores 2." I found 8 in Mr. Larbalestier's specimen.

10. *V. mutabilis*, Borr. *warm-umber-coloured, like a dark-brown oily stain*, thin, filmy, membranaceous, continuous, smooth, subdeterminate or effuse, often nearly evanescent; *apothecia brownish-black*, minute, scattered, *numerous*, *prominent*, hemispherical, *opake*, sometimes polished and shining, internally pale; epithecium minutely poriform; perithecium dimidiate; paraphyses none; *spores* 8, colourless, oblong, simple, *very minute*, half the size of those of *V. acrotella*.

On stones, rocks, and pebbles, not common. 1807.

Syn :—Leight. Ang. Lich. 55. excl. syn. (1851.) Mudd Man. 293.
Fig :—Leight. l. c. t. 24. f. 3.
Geog. Distrib :—Europe.

BOT. PROV :—1, 2, 3...5...7.
ENGLAND :—Sussex! *Mr. Borrer.* (1807.) Bagley Wood! near Oxford. *Mr. Jenner.* Salcombe Hill, Sidmouth; Exmouth. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Farm Road, Park, Cirencester. *Mr. Joshua.* Wrekin Hill! Alberbury! near Shrewsbury! Shropshire.
WALES :—Craig Breidden! Montgomeryshire.
"Spores .003 in. long, by .001 to .00125 in. broad." (*Mudd.*) Spores .008—.012 mm. long, .0055—.007 mm. broad.

11. *V. lævata*, Ach. *dirty-whitish or pale-greyish-brown*, thickish, *tartareo-cartilaginous, smooth, continuous or eventually rimulose or rimuloso-areolate; apothecia immersed* in and covered by the thallus, small, partially emerging; *ostiolum black and polished*, conical, more or less denuded; epithecium poriform, impressed; *perithecium* thickish, black, *entire*; spores 8, colourless, elliptical, simple, moderately large; paraphyses none; gelatina hymenea vinous-red with iodine.

Rocky beds of mountain streams, not common. 1830.

SYN :—Ach. L. U. 284. (1810.) Syn. 94. Leight. Ang. Lich. 44. Mudd Man. 286.
FIG :—E. Bot. Suppl. t. 2623. f. 2. Leight. Ang. Lich. t. 19. f. 1. & 2.
EXS :—Leight. 198. Mudd 272. 273. Rabh. 774. M. & N. 952.
GEOG. DISTRIB :—Germany.
BOT. PROV :—5...7...10, 11...19.
ENGLAND :—North of England! Teesdale! Tyne near Newcastle! *Mr. Robertson.* (1830.) near Ayton! Airyholme Wood! Cleveland. *Mr. Mudd.* Bishop's Stow, Torquay. *Mr. Parfitt.* River Oney between Abdon and Tugford! River Morda under Craigforda, Shropshire!
IRELAND :—Killarney. *Sir T. Gage.* Middle Road! and Sunday's Well Weirs! near Cork. *Mr. Carroll.* Dunkerron! *Dr. Taylor.*
WALES :—Between Llangollen and Corwen!; Barmouth!
"Spores .004 to .0045 in. long, by .0015 to .002 in. broad." (*Mudd.*) Spores .020 mm. long, .011 mm. broad.

Var. *nigrata*, Leight. *umbrino-nigricant*, covering the numerous, crowded, rather large apothecia.

On stones in running water, rare. 1876.

ENGLAND :—Chedworth! Gloucestershire. *Mr. Joshua.* (1876.)

12. *V. prominula*, Nyl. *greyish-white or pale-brown*, thin, tartareous, *continuous*, rugulose, effuse; *apothecia black, large, prominent*, subglobose, scattered; epithecium very slightly depressed, poriform; *perithecium entire*; spores 8, colourless, broadly oblong or elliptical, simple, granular.

On maritime rocks, rare.

SYN :—Nyl. in litt. Mudd Man. 291. (1861.) Carroll in Seem. Journ. Bot. 4. 25.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...19...22.
ENGLAND :—Exmouth. *Mr. Parfitt.*
IRELAND :—Derryquin, Kerry. *Dr. Taylor.* In a cave at the Diamond rocks, Kilkee. Clare. *Mr. Carroll.*
"Spores .0025 in. long, by .0015 to .00175 in. broad." (*Mudd.*)

*** *Thallus rimuloso-areolate.*

13. *V. maura*, Whlnb. *coal-black or dark-reddish-black*, thick, smooth, *minutely coarsely* rimuloso-areolate, somewhat polished and shining, *areolæ* either *smooth* or *covered with very minute papillæ or*

*elevated points*, their margin slightly raised into a sharp elevated rim; *apothecia entirely immersed* in, and covered by the thallus, moderate, hemispherical, scattered; ostiolum more or less elevated and denuded; epithecium large, poriform; *perithecium dimidiate*, spreading widely at the base, inner tunic black; paraphyses none; spores 8, colourless, oblong, simple; gelatina hymenea vinous-red with iodine.

On maritime rocks, not common. 1812.

SYN:—Whlnb. in Ach. Meth. Suppl. 19. (1803.) Nyl. Scand. 273. Leight. Ang. Lich. 59. Mudd Man. 284.

FIG:—E. Bot. t. 2456. Leight. Ang. Lich. t. 25. f. 2.

EXS:—Leight. 33. in part. Hepp 716. Fellm. 213. 214.

GEOG. DISTRIB:—Europe, Norway, Finmark, E. Lapland, E. Indies.

BOT. PROV:—1...6...7...11...14, 15...18...30, 31.

ENGLAND:—Torquay. *Mr. Parfitt.* Islands near Bamburgh! Northumberland. *Mr. Borrer.* Black Hall rocks near Hartlepool, Durham. *Mr. Mudd.* Boldon, Cleadon, Castle Eden Dene; Teesdale, Durham; Dunstanborough and Holy Island, Northumberland. *Mr. Winch.*

SCOTLAND:—Dunbar! *Mr. Borrer.* Newhaven! Leith. *Dr. Greville.* Kincardine. *Rev. J. M. Crombie.* Stennis, Orkney. *Dr. Lindsay.*

IRELAND:—Ardglass, co. Down. *Dr. Maingay.* Bantry. *Dr. Taylor.* Tully! co. Galway. *Mr. Larbalestier.*

WALES:—Barmouth! *Rev. T. Salwey.* Bala Lake. *Mr. Holmes.* Black Stones! Conway Bay! Gimlet Rock! Pwlhelli; Y Figle fawr! near Barmouth. Caswell Bay! Mumbles. Fishguard Harbour! Goodwick Bay! Manorbeer! near Tenby. Harlech Castle! Craig Dhu! near Criccieth.

CHANNEL ISLANDS:—Jerbourg, Guernsey; Noirmont! Jersey. Common on all the Islands. *Mr. Larbalestier.*

"Spores .0025 to .003 in. long, by .001 to .00125 in. broad." (*Mudd.*) "Spores .012—16 mm. long, .007—8 mm. broad." (*Nyl.*) Spores .013—.0155 mm. long, .0075—.008 mm. broad.

*V. aractina*, Whlnb. has no other character than the punctato-scabrid appearance of the areolæ, but this is more or less observable and intermixed with smooth areolæ on all specimens of *V. maura*.

14. *V. mauroides*, Schær. *dark-umber or nearly black*, thin, uniform, *rimuloso-areolate*, smooth; *apothecia* minute, very numerous and crowded, innate, *at length emersed*, hemispherico-conoid, black, somewhat shining; epithecium poriform; *perithecium dimidiate*, not spreading at the base, inner tunic thin, dark-brown; paraphyses crowded, indistinct; spores 8, colourless, oblong, simple.

On rocks and walls, frequent. 1805.

SYN:—Schær. Spicil. 335. (1836.) Enum. 215. *V. umbrina*, Leight. Ang. Lich. 52. Mudd Man. 287.

FIG:—E. Bot. t. 1499. Leight. Ang. Lich. t. 23. f. 2.

EXS:—Leight. 101.

GEOG. DISTRIB:—Switzerland, Italy.

BOT. PROV:—1, 2—4, 5...7...10...12.

ENGLAND:—Gorlestone Church, Suffolk! *Mr. Turner.* (1805.) Sussex! *Mr. Borrer.* Nent Force! Cumberland. *Mr. Robertson.* Oswestry! Shropshire; Penzance. *Rev. T. Salwey.* Ayton and Lanbraugh, Cleveland. *Mr. Mudd.* Babbicombe near Torquay. *Dr. Deakin.* Exmouth. *Mr. Parfitt.* Shingles, Eastbourne. *Mr. Roper.* High Rock! near Bridgnorth; Uffington! Myndd-y-Myfyr! Llanymynech! Shropshire.

WALES:—Dolgelley. *Dr. Holl.* Aberdovey! *Rev. A. Bloxam.* Llandeilo! between Corwen and Bala! Diganwy! near Conway, Capel Curig.!

"Spores .004 in. long, by .00125 to .0015 in. broad." (*Mudd.*) Spores .0165—.017 mm. long, .008—.009 mm. broad.

15. *V. nigrescens*, (Pers.) *dark-brown or nearly black*, thickish, crustaceous, *rimuloso-areolate or uneven, loose and crumbling*, raised

into low warty elevations around the apothecia, sub-determinate; *apothecia* dull-black, *large*, more or less numerous and crowded, hemispherical, *thin*, *apices generally visible*, though sometimes covered by the thallus, their basal circumference surrounded by the scaly elevations of the thallus; *perithecium dimidiate, spreading at the base;* paraphyses none; spores 8, colourless, oblong, simple; gelatina hymenea vinous-red with iodine.

On calcareous rocks, frequent.

SYN:—Pers. in Ust. Ann. Bot. st. 14. p. 36. (1795.) Leight. Ang. Lich. 63. Mudd Man. 289.
FIG:—Leight. Ang. Lich. t. 27. f. 1.
EXS:—M. & N. 1065. Mudd 277 Schær. 439. Anzi It. S. 365. 366.
GEOG. DISTRIB:—Sweden, Germany, Switzerland, France, Aus tria, Italy, Algeria, Africa, N. America.
BOT. PROV:—1, 2, 3...5, 6, 7, 8...10...15..17...(19—30)...31.
ENGLAND:—Sussex! *Mr. Borrer.* Carlton Bank! Cleveland. *Mr. Mudd.* Gopsal! Leicestershire. *Rev. A. Bloxam.* Torquay! *Dr. Deakin.* Isle of Wight! Penzance! Lamorna! Cornwall. *Rev. T. Salwey.* Kelvedon, Essex. *Mr. Varenne.* Plymouth; Otford, Sevenoaks, Maidstone, Kent. *Mr. Holmes.* Cirencester Park. *Mr. W. Joshua.* Bromsgrove Lickey! Worcestershire; Ludlow! Steeraway! Wrekin! Shropshire.
SCOTLAND:—Near Aberdeen, Stirling; Craig Guie; Morrone; Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND:—On calcareous rocks. *Mr. Carroll.* Mullaghglass! Galway. *Mr. Larbalestier.*
WALES:—Penmaenmawr! Trefriw! Nevin! Gimlet Rock! Pwlhelli; Y Figle fawr! near Barmouth; Fishguard Bay! Harlech Castle!
CHANNEL ISLANDS:—Common on all the Islands. *Mr. Larbalestier.*
"Spores .005 to .0055 in. long, by .002 to .00275 in. broad." *(Mudd.)* Spores .019—.024 mm. long, .009 mm. broad.

16. *V. fuscocinerascens*, Nyl. *dark-brown or reddish-brown, thin*, crustaceous, *minutely rimuloso-areolate*, uneven, raised into low warty elevations around the base of the apothecia; *apothecia* dull-black, *large*, *scattered*, hemispherical, *apices visible*; *perithecium dimidiate*; paraphyses none; spores 8, colourless, oblong, simple, often binucleolate or spuriously 1-septate.

On micaceous schistose rocks, rare. 1875.

SYN:—Nyl. in Flora 1876. p. 310.
BOT. PROV:—26.
IRELAND:—Dawros River! Connemara. *Mr. Larbalestier.* (1875.)
"Allied to *V. fusconigrescens*, (*Nyl.*) Spores .022—27 mm. long, .008—10 mm. broad." (*Nyl.*) Spores .0255 mm. long, .011 mm. broad. Apparently only a state or form of *V. nigrescens*, (Pers.)

17. *V. aquilella*, Nyl. *lurido-fuscous* or somewhat dun colour, *minutely areolate or areolato-granulate*, thin; *apothecia black*, *naked*, rugulose; perithecium dimidiate; spores 8, colourless, ellipsoid, simple; paraphyses none.

On micaceo-schistose rocks, rare. 1876.

SYN:—Nyl. in Flora 1876. p. 237.
BOT. PROV:—5, 6, 7...26.
ENGLAND:—Artington, Gloucestershire. *Mr. Joshua.*
IRELAND:—Lough Inagh! Connemara. *Mr. Larbalestier.* (1875.)
WALES:—Tenby, north cliff! (1871.) Nevin! Penmaenmawr! Dolgelley!
"Spores .018—.22 mm. long, .007—9 mm. broad. Compare with *V. umbrinula*, Nyl. in Flora 1870. p. 37., from which it differs in the firmer and not subleprose thallus." *(Nyl.)* Surely only a var. or state of *V. nigrescens*. Spores .021—.024 mm. long, .010 mm. broad.

18. *V. plumbea*, Ach. *plumbeo-cinerascent or lead-coloured or greyish-brown*, thickish, determinate, smooth, *rimulose* or rimuloso-areolate; *apothecia* black, small, *immersed, slightly prominent; ostiolum depressed;* epithecium poriform; *perithecium* thick, *entire;* spores 8, colourless, ellipsoid or oblong, simple, small; paraphyses none; gelatina hymenea vinous-red with iodine.

On calcareous rocks, not common. 1813.

SYN :—Ach. L. U. 285. (1810.) Nyl. Scand. 271. Mudd Man. 288.
FIG :—E. Bot. t. 2540. Leight. Ang. Lich. t. 19. f. 5.
EXS :—Schær. 102. 643. Hepp 223. Mudd 275. Zw. 248.
GEOG. DISTRIB :—Switzerland, Austria, Italy, Germany, Bavaria.
BOT. PROV :—1...5...10, 11...16...19...24...30.
ENGLAND :—Chedder! Somersetshire. *Mr. Borrer.* (1813.) near Middleton! Teesdale. *Rev. J. Harriman.* Hartlepool, Durham! Newton Wood! Cleveland. *Mr. Mudd.* Chedworth Woods, Gloucestershire. *Mr. W. Joshua.* Wenlock Priory! Llanymynech Hill! Shropshire.
SCOTLAND :—Appin. *Rev. J. M. Crombie.*
IRELAND :—Near Belfast. *Mr. Templeton.* Dunkerron. *Dr. Taylor.* Dromoland, co. Clare. *Mr. Carroll.* Cong! Lough Corrib. *Mr. Larbalestier.* Glencorbot!
"Spores .0025 to .003 in. long, by .001 in. broad." (*Mudd.*) "Spores .015—19 mm. long, .007—8 mm. broad." (*Nyl.*) Spores .014—.016 mm. long, .007 mm. broad.

19. *V. peloclita*, Nyl. *grey or cinereo-fuscescent*, thin, smooth, *areolato-rimulose;* apothecia *black*, somewhat prominent; perithecium dimidiate, black; *ostiolum impressed;* spores 8, colourless, oblong, simple, small.

On shady rocks, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 461.
BOT. PROV :—26.
IRELAND :—Twelve Pins, Connemara. *Mr. Larbalestier.* (1876.)
"Allied to *V. truncatula*, but with different thallus and spores. Spores .011—15 mm. long, .005—6 mm. broad." (*Nyl.*) In general appearance very like *V. plumbea*, but with smaller spores.

20. *V. thelostoma*, Harrim. *cinereo-rufous*, tartareous, thin, *continuous, minutely rimuloso-areolate*, determinate; *apothecia rufous-brown, verrucæform*, elevated, sessile, *hemispherical, depressed and umbonate* in the centre; perithecium entire, pale below, rufous-brown above; paraphyses distinct; spores 8, colourless, ellipsoid, simple.

On whinstone rocks, very rare. 1807.

SYN :—Harriman in Winch Bot. Guide, v. 2. p. 44. (1807.) Mudd Man. 293. *Pyrenula umbonata*, Ach. L. U. 316. Syn. 121. *Segestrella thelostoma*, Leight. Ang. Lich. 34.
FIG :—E. Bot. 2153. Leight. Ang. Lich. t. 15. f. 2.
GEOG. DISTRIB :—Europe.
BOT. PROV :—11.
ENGLAND :—Near Eglestone, Durham! *Rev. J. Harriman.* (1807.)
"Spores .004—.0045 in. long, by .002 in. broad." (*Mudd.*) Spores .017—.018 mm. long, .009—.010 mm. broad.

21. *V. thrombioides*, Bagliet. *cervino-rufescent, cartilaginous* effuse, *shining, contiguous*, at length *rimuloso-areolate*; *apothecia black, large, immersed*, then emersed, and *prominent at the depressed apex*; paraphyses none; perithecium dimidiate, thick and black, inner tunic thin, membranaceous and black; spores 8, colourless, broadly oblong or oblongo-ellipsoid, simple, granulose, very large.

SYN :—Mass. Symm. 89. (1855.)
EXS :—Anzi Venet. 160.
GEOG. DISTRIB :—Italy.
BOT. PROV :—5.
ENGLAND :—Cowcombe Wood, Gloucestershire. *Mr. Joshua.* (1876.)
Spores .028—.032 mm. long, .0165—.020 mm. broad. Nearly allied to, if not identical with *viridula.*

**** *Thallus areolato-diffract.*

22. *V. fuscella*, Turn. *dark-greyish-brown*, crustaceous, thickish, *areolato-diffract*, nigro-limitate, *areolæ smooth, intersected with minute dark lines from the predominant hypothallus ;* apothecia minute, immersed in the areolæ ; *ostiolum nearly plane*, depressed ; epithecium poriform ; *perithecium entire, pale ;* paraphyses none ; spores 8, colourless, narrow-oblong, simple.

On walls, &c., rare. 1804.

SYN :—Turn. in Linn. Trans. 7. p. 90. (1804.) Ach. L. U. 289. Leight. Ang. Lich. 23. Mudd Man. 288.
FIG :—E. Bot. t. 1500. Leight. Ang. Lich. t. 7. f. 2.
EXS :—Arn. 388. Hepp 90. Mudd 276.
GEOG. DISTRIB :—Germany, Switzerland, Hungary, Bavaria.
BOT. PROV :—1, 2, 3, 4...7...11...13, 14, 15...19...31.
ENGLAND :—Gorlestone Church, Norfolk. *Mr. Turner.* (1804.) Sussex ! *Mr. Borrer.* near Stanhope ! Durham. *Mr. Mudd.* Penzance. *Mr. Curnow.* Malvern. *Mr. Lees.* Upperton Farm, Eastbourne. *Mr. Roper.* Hythe, Kent. *Mr. Holmes.* Llanymynech Hill ! Sbropshire.
SCOTLAND :—Central parts. *Rev. J. M. Crombie.*
IRELAND :—Dunkerron Castle, co. Kerry. *Dr. Taylor.*
WALES :—Bangor. *Mr. Holmes.*
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*
"Spores .003 to .0035 in. long, by .001 to .00125 in. broad." (*Mudd.*) Spores .014—.0155 mm. long, .006—.007 mm. broad.

23. *V. polysticta*, Borr. *creamy-white*, somewhat glaucescent, crustaceous, thin, *areolato-diffract*, nigro-limitate, *areolæ smooth, plane, with a somewhat elevated thin black edge from the predominant hypothallus ;* apothecia black, small, immersed in the areolæ ; *ostiolum prominent, sub-convex ; perithecium entire, black ;* spores 8, colourless, narrow-oblong, simple, of the same size as those of *fuscella.*

On walls &c., rare. 1832.

SYN :—Borr. in E. Bot. Suppl. 2741. (1832.) Leight. Ang. Lich. 49. Mudd Man. 288.
FIG :—E. Bot. Suppl. t. 2741. Leight. Ang. Lich. t. 21. f. 5.
EXS :—Anzi It. S. 363. Nyl. 147.
GEOG. DISTRIB :—Italy, Bavaria, Germany, France.
BOT. PROV :—1, 2...4...10...23—31.
ENGLAND :—Sussex ! *Mr. Borrer.* (1832.) Suffolk ! *Rev. G. R. Leathes.* Isle of Wight ! *Rev. T. Salwey.* Rievaulx Abbey ! Yorkshire. *Mr. Mudd.* Exeter. *Mr. Parfitt.*
IRELAND :—Eastern Counties. *Dr. Moore.*
CHANNEL ISLANDS :—Hill above Fort Essex, Alderney ! *Mr. Larbalestier.*
"Spores .00275 to .003 in. long, by .001 in. broad." (*Mudd.*) Spores .016 mm. long, .006 mm. broad.
This and *fuscella* may be only states of the same lichen.

24. *V. glaucina*, (Ach.) *glaucous or leaden-grey*, thickish, crustaceous, *areolato-diffract, nigro-fusco-limitate, areolæ smooth, plane or plano-convex, edged with the predominant nigro-fuscous hypothallus ; apothecia* blackish, immersed, *two or more on each areola, to*

*which by their confluence, they often give a blotchy appearance*; *ostiolum plane*, flat; *perithecium entire, black*; spores 8, colourless, elliptical, simple, double the size of those of *fuscella and polysticta*.

On calcareous rocks and walls, frequent.

SYN :—Ach. Syn. 94. (1817.) Mudd Man. 289.
EXS :—Anzi Ital. S. 362.
GEOG. DISTRIB :—Italy, Hungary.
BOT. PROV :—1...3...5...7...11 ..19...28.
ENGLAND :—Teesdale, Durham. *Rev. J. Harriman.* South side of river Wear opposite Stanhope, Durham. *Mr. Mudd.* Plymouth ! Abbey Wood, Sevenoaks, Kent. *Mr. Holmes.* Tetsworth Church ! Oxfordshire. *Mr. Larbalestier.* Grove Lane near Cirencester. *Mr. W. Joshua.* Saltwood Castle near Hythe. *Mr. Holmes.* Wenlock Priory ! Llanymynech Hill ! Craigforda ! Llanforda ! Shropshire.
IRELAND :—Near Bantry. *Miss Hutchins.* Sheep walk, Armagh. *Adm. Jones.* Dawros river ! Galway. *Mr. Larbalestier.*
WALES :—Bangor. *Mr. Holmes.* Eglwyseg Rocks ! near Llangollen ; Great Orme's Head !
Spores .0155—.024 mm. long, .0085—.011 mm. broad.

25. *V. elachistophora*, Nyl. *white*, unequal, *rimoso-diffract*, (K yellow) ; *apothecia* (possibly parasitic) *black, only slightly emersed ; perithecium black, entire ;* epithecium slightly impressed ; paraphyses moderate ; spores 8, coiourless, oblongo-ellipsoid, simple (or sometimes spuriously 1-septate.)

On quartzose rocks, rare. 1877.

SYN :—Nyl. in Flora 1878. p. 246.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.*
"Spores .007—8 mm. long, .0035 mm. broad. Gelatina hymenea I—." (*Nyl.*)

26. *V. macrostoma*, (Duf.) *olive-tawny*, thick, crustaceous, *areolato-diffract*, *areolæ* rather large, somewhat *rugged*, or raised into small irregular warts or scaly elevations ; *apothecia* black, *tolerably large*, one or several *immersed* in each areola ; ostiolum more or less prominent, black ; *perithecium entire*, black ; spores 8, colourless, elliptical, simple.

On walls and mortar, rare. 1851.

SYN :—D. C. Fl. Fr. 3. vol. 2. 319. (1805.) Leight. Ang. Lich. 48. Mudd Man. 289.
FIG :—Leight. Ang. Lich. t. 21. f. 4.
EXS :—Larbal. 97. Mass. 194. Zw. 214. Nyl. 94. Mudd 278. Anzi Venet. 156.
GEOG. DISTRIB :—France, Spain, Italy, Germany.
BOT. PROV :—1, 2, 3...5 7, 8...10...15...26...31.
ENGLAND :—Sussex ! *Mr. Borrer.* (1851.) Thringstone ! Leicestershire. *Rev. Ch. Babington.* Guisbro' Church ! Cleveland. *Mr. Mudd.* Plymouth ! Saltwood Castle near Hythe. *Mr. Holmes.* Penzance. *Mr Curnow.* Breedon Hill ! Leicestershire ; Pulley ! near Shrewsbury, Shropshire.
SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND :—Twelve Pins ! Connemara. *Mr. Larbalestier.*
WALES :—Llanaber ! near Barmouth ; Criccieth Castle !
CHANNEL ISLANDS :—St. Aubin's ! Jersey, and on all the Islands. *Mr. Larbalestier.*
"Spores .005 to .0055 in. long, by .00225 to .00275 in. broad." (*Mudd.*)
Spores .019—.020 mm. long, .011 mm. broad.

27. *V. ochrostoma*, Borr. *dusky-cream or grey or olivaceous or brownish-black or umber*, moderately thick, crustaceous, *verrucoso-rugose, areolato-diffract ; apothecia* black, numerous, minute, *entirely*

*immersed; ostiolum* black, *slightly elevated, hemispherico-conoid;* epithecium poriform; *perithecium entire, thin, black;* spores 8, colourless, elliptical, simple.

On plastered walls, rare. 1851.

SYN :—*Sagedia*, Leight. Ang. Lich. 23. (1851.) Mudd Man. 290.
FIG :—Leight. Ang. Lich. t. 7. f. 4.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2.
ENGLAND :—Sussex! *Mr. Borrer.* (1851.) Midweald Mid-Sussex! *Mr. G. Davies.*
"Spores .004 in. long, by .00175 to .002 in. broad." (*Mudd.*) Spores .020—.021 mm. long, .010 mm. broad.

28. *V. viridula*, (Schrad.) *pale-brown ar greenish-olive-brown*, thickish, tartareous, *areolato-diffract, areolæ polygonal, granulato-crenate, smooth or rugose or verruculose*, effuse; *apothecia* black, *large, semi-immersed*, conical; *perithecium dimidiate*, very thick and black, *inner tunic* thin, membranaceous and *black; spores* 8, colourless, broadly elliptical, simple, granular, *very large*.

On mortar, old walls, rocks, &c., frequent. 1798.

SYN :—*Endocarpon*, Schrad. Spic. 192 (1794.) *Verrucaria*, Ach. L. U. 675. Mudd Man. 289. *Sagedia*, Leight. Ang. Lich. 23.
FIG :—E. Bot. t. 533. (bad) Leight. Ang. Lich. t. 7. f. 3.
EXS :—Leight. 229. Mudd 279. Nyl. 95. Hepp 91. 943. Mass. 21. 209. 331. Arn. 101. 170. b. 367. 81. 365. Anzi Venet. 157. 160. 159. Zw. 404. Rabh. 875. Anzi Ital. S. 377. 367. Anzi Etr. 39.
GEOG. DISTRIB :—Germany, Bavaria, Italy, Hungary, Africa, N. America.
BOT. PROV :—1, 2, 3, 4, 5, 6, 7, 8...10, 11...15...19...26, 27...31.
ENGLAND :—Yarmouth. *Mr. Turner.* (1798.) Sussex! *Mr. Borrer.* Hartlepool, Durham; near Ayton! Guisboro'! Airyholme! Stokesley! Cleveland. *Mr. Mudd.* Twycross! Breedon Hill! Leicestershire. *Rev. A. Bloxam.* Norton and Bevere! Worcester. *Dr. Holl.* Torquay! *Dr. Deakin.* Shanklin Church, Isle of Wight! *Rev. T. Salwey.* Batheaston! *Mr. Broome.* Countess Weir Bridge; Westleigh! Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Tetsworth! Oxfordshire. *Mr. Larbalestier.* Shifnal! Comley! Wenlock! High Rock near Bridgnorth! Hope Valley! all in Shropshire: Aymestry! Herefordshire.
SCOTLAND :—Spittall of Glenshee, Perthshire. *Dr. Lindsay.* near Aberdeen; Cove, Kincardine. *Rev. J. M. Crombie.*
IRELAND :—Castle Taylor, Galway. *Dr. Moore.* Great Island and Rosscarberry, Cork. *Mr. Carroll.* Ballynakill! Galway. *Mr. Larbalestier.*
WALES :—Between Llangollen and Corwen! near Dolgelley! Fishguard Harbour! Pembrokeshire.
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores. 006 to .0065 in. long, by .003 to .0035 in. broad." (*Mudd.*) Spores .031—.033 mm. long, .016—.017 mm. broad.

***** *Thallus pulverulent.*

† *Apothecia semi-immersed, prominent.*

29. *V. murina*, Leight. *mouse-coloured, or cinereo-griseous*, thin, tartareous, *pulverulent*, effuse; *apothecia* dark-brownish-black, *prominent, semi-immersed*, hemispherico-convex; *perithecium* thick, black, *entire;* epithecium poriform, umbilicate; spores 8, colourless, elliptical, simple; paraphyses indistinct; gelatina hymenea vinous-red with iodine.

On calcareous rocks, rare. 1836.

SYN :—Leight. Ang. Lich. 44. (1851.) Mudd Man. 291.
FIG :—Leight. l. c. t. 19. f. 3.
GEOG. DISTRIB :—Germany, Sweden.
BOT. PROV :—1, 2...5 ..19.
ENGLAND :—St. Ives! Cornwall; Shanklin, Isle of Wight. *Rev. T. Salney.* Sussex! *Mr. Borrer.* near Exeter. *Mr. Parfitt.* near Cirencester. *Mr. W. Joshua.* Mynydd-y-Myfyr! Oswestry! Abdon Burf! Shropshire.
IRELAND :—Dunkerron! *Dr. Taylor.* (1836.) Monkstown! Glanmire! near Cork! *Mr. Carroll.* Cong! on Lough Corrib. *Mr. Larbalestier.*
"Spores .005 to .006 in. long, by .0025 to .003 in. broad." (*Mudd.*) Spores .022—.0255 mm. long, .014—.015 mm. broad.

30. *V. myriocarpa*, Hepp. *cinereous or fumose*, pulverulent; *apothecia black*, numerous, scattered, *very minute, globose, semi-immersed;* perithecium entire, black; paraphyses none; spores 8, colourless, *lineari-oblong*, simple.

On moist rocks, rare. 1876.

SYN :—Körb. Par. 375. *V. Pazientii*, Mass. Misc. 29.
EXS :—Hepp 430. Arn. 198. 285.
GEOG. DISTRIB :—Switzerland, Germany.
BOT. PROV :—1...26.
ENGLAND :—Torquay! Devon. *Dr. Deakin.* (1853.)
IRELAND :—Recess Road! and Lough Inagh, Connemara; ruins at Cleghan. *Mr. Larbalestier.* (1876.)
Spores .011—.018 mm. long, .008 mm. broad.

31. *V. rupestris*, Schrad. *white, greyish-white or pale-brown*, thin, tartareous, pulverulent or sub-furfuraceous, effuse; *apothecia* black, moderate, numerous, *semi-immersed, prominent*, hemispherical; *perithecium dimidiate*, more or less spreading at the base, *inner tunic* very thin, *pale-brown;* spores 8, colourless, elliptico-oblong, simple.

On flints, chalk, sandstone, &c., frequent.

SYN :—Schrad. Spic. 109. (1794.) Leight. Ang. Lich. 60.
FIG :—Leight. Ang. Lich. t. 25. f. 4.
EXS :—Leight. 140. Schær. 103. Hepp 224. Arn. 175.
GEOG. DISTRIB :—Bavaria, Italy, Pyrenees, Africa, N. America.
BOT. PROV :—1, 2, 3...5, 6, 7, 8...15...(19—26—30)...31.
ENGLAND :—Sussex! *Mr. Borrer.* Ayton! Cleveland. *Mr. Mudd.* Twycross! Leicestershire. *Rev. A. Bloxam.* Kelvedon, Essex. *Mr. Varenne.* Cleadon, and Boldon Hills, Castle Eden, Middleton-in-Teesdale, between Widdy Bank and Couldron Snout, Durham. *Mr. Winch.* Plymouth. *Mr. Holmes.* Malvern. *Mr. Lees.* near Cirencester. *Mr. W. Joshua.* Ingsdon, Devon. *Messrs. Jones & Kingston.* Bromsgrove Lickey! Worcestershire.
SCOTLAND :—Frequent. *Rev. J. M. Crombie.*
IRELAND :—Rocks and walls, common. *Mr. Carroll.* Westport! co. Mayo. *Mr. Larbalestier.*
WALES :—Aberdovey! *Rev. A. Bloxam.* between Llangollen and Corwen! Trefriw! Builth! Goodwick Bay! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—La Moie, Jersey; Guernsey. *Mr. Larbalestier.*
"Spores .0035 to .004 in. long, by .0015 in. broad." (*Mudd.*) "Spores .020—25 mm. long, .010—13 mm. broad." (*Nyl.*) Spores .022 mm. long. .013 mm. broad.

Var. *muralis*, Ach. *greyish-white, tartareo-farinose*, thin, effuse, often evanescent; apothecia black, semi-immersed, hemispherical; perithecium dimidiate, more or less spreading at the base, inner tunic pale-brown; spores as in the type.

On brick walls, mortar, &c., frequent.

SYN :—Ach. Meth. 115. (1803.) Mudd Man. 292. *V. patula*, Leight. Ang. Lich. 61.
FIG :—Leight. Ang. Lich. t. 26. f. 1.
EXS :—Fries 357. Th. M. Fries 25. Arn. 174.
GEOG. DISTRIB :—Sweden, Bavaria, Switzerland, Italy, Austria, Hungary.
BOT. PROV :—1, 2, 3...5...8...23...31.
ENGLAND :—Sussex. *Mr. Borrer.* Madron! Newlyn! Cornwall. *Rev. T. Salwey.* Pennsylvania, Exeter. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* Malvern. *Mr. Lees.* near Purton, Glostershire. *Mr. W. Joshua.* Hythe, Kent. *Mr. Holmes.* Pulley! Wolverley Bridge! near Loppington; Middle! Bayston Hill! Burlton! Shropshire; Breedon Hill! Leicestershire.
IRELAND :—Near Dublin. *Adm. Jones.*
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*
"Spores .018—28 mm. long, .011—14 mm. broad." *(Nyl.)* Spores .019—.021 mm. long, .011—.013 mm. broad.

Var. *subalbicans*, Leight. *greyish-white*, very thin, *continuous and crumbly*, effuse or *evanescent; apothecia* black, numerous and crowded, *large, prominent*, semi-immersed, *conical or hemispherical*, more or less rugged and pruinose; epithecium poriform, dilated; perithecium dimidiate, spreading at the base, *inner tunic* thin, *black;* spores as in the type.

On mortar, plastered walls, rocks, &c., frequent. 1851.

SYN :—Leight. Ang. Lich. 56. (1851.) Mudd Man. 292.
FIG :—Leight. l. c. t. 25. f. 1.
EXS :—Leight. 200.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2—7...10.
ENGLAND :—Sussex! *Mr. Borrer.* (1851.) Rocky Valley! Torquay. *Dr. Deakin.* Ayton! Cleveland. *Mr. Mudd.* Countess Weir Bridge, Exeter. *Mr. Parfitt.* Malvern. *Mr. Lees.*
WALES :—Cell-fechan! Barmouth. *Rev. T. Salwey.* Bangor!
Spores .017—.020 mm. long, .011 mm. broad.

32. *V. integra*, Nyl. *white* or slightly greyish-white, thin, *subcrustaceous, continuous, tartareo-sub-farinose; apothecia* black, numerous and crowded, moderate, *semi-immersed, depresso-hemispherical;* epithecium poriform, often dilated; perithecium dimidiate, very thick, black, inner tunic black and tough; paraphyses none; *spores* 8, colourless, broadly elliptico-oblong, simple, granular, large, *double the size of those of V. rupestris.*

On sandstone, rare.

SYN :—*V. rupestris var. integra*, Nyl. Prodr. 183. (1857.) Pyren. 31. Scand. 276.
GEOG. DISTRIB :—France, Scandinavia, Lapland.
BOT. PROV :—2...4...16...19.
ENGLAND :—Hurstpierpoint! Sussex. *Mr. Larbalestier.* Luccomb Chine! Shanklin, Isle of Wight. *Dr. Holl.* Northamptonshire. *Mr. Larbalestier.*
SCOTLAND :—Appin; Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND :—Near Cork. *Mr. Carroll.*
"Spores .023—30 mm. long, .009—.015 mm. broad." (*Nyl.*) Spores .037 mm. long, .020 mm. broad.

33. *V. pulposa*, Leight. *thallus chroolepoid* or evanescent; *apothecia nigricant, sub-sphœrical, pulpose, polished*, prominent; *epithecium indistinct; perithecium dimidiate*, nigricant; *spores* numerous, *fuscous*, oblong or irregularly globose, *simple;* paraphyses very short, crowded; gelatina hymenea untinged with iodine.

On old rails, rare. 1870.

GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Porthill ! near Shrewsbury, Shropshire. (1870.)

†† *Apothecia insculpted.*

34. *V. calciseda*, D.C. *white or greyish-white*, thin, tartareous, *pulverulent*, effuse or evanescent ; *apothecia black, minute, very numerous, deeply immersed and insculpted in the thallus and rock* ; ostiolum depresso-hemispherical ; epithecium poriform, often irregularly fissured ; perithecium dimidiate, black, inner tunic black ; paraphyses none ; spores 8, colourless, elliptico-oblong, simple, granular ; gelatina hymenea vinous-red with iodine.

On calcareous rocks, frequent.

SYN :—DC. Fl. Fr. l. 317 (1805.) Mudd Man. 292. *Limboria sphinctrina*, Nyl. Pyren. 62.
EXS :—Leight. 30. Mudd 280. Schær. 104. M. & N. 951. Anzi Ital. S. 373. 375. 376. Arn. 310. 309. 311.
GEOG. DISTRIB :—Switzerland, Bavaria, Italy, France.
BOT. PROV :—1...4, 5, 6, 7...10...15...(19—30).
ENGLAND :—Bilsdale ! Yorkshire. *Mr. Mudd.* Bury, Suffolk. *Mr. Larbalestier.* Chudleigh ; Berry Head, Devon. *Mr. Parfitt.* near Cirencester. *Mr. W. Joshua.* Llanymynech Hill ! Shropshire.
SCOTLAND :—Craig Guie ; Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND :—On limestone, common. *Mr. Carroll.*
WALES :—Great Orme's Head ! Eglwyseg rocks ! Giltar Point ! Tenby.
"Spores .0035 in. long, by .0015 to .002 in. broad." (*Mudd.*) Spores .020—.021 mm. long, .010 mm. broad.

Var. *purpurascens*, (Hffm.) thallus of a *pale-rose or rosy-purple* tinge ; apothecia larger.

On calcareous rocks, rare. 1861.

SYN :—Hoffm. Pl. Lich. 1. 74. (1790.) Nyl. Pyrenoc. 31. Mudd Man. 292.
FIG :—Hoffm. Pl. Lich. t. 15. f. 1. & t. 19. f. 3.
EXS :—Schær. 440. Mass. 207. Anzi Langob. 246.
GEOG. DISTRIB :—France, Switzerland, Pyrenees, Italy, Bavaria.
BOT. PROV :—1...11.
ENGLAND :—Castle Eden Dean, Durham. *Mr. Mudd.* (1861.) Exeter. *Mr. Parfitt.*
Spores .022—.023 mm. long, .012—.013 mm. broad.

****** *Thallus squamulose.*

35. *V. tephroides*, (Ach.) *cinereous or albido-cinereous or cinereo-fuscescent, squamulose*, squamulæ adnate, smooth, *tessellato-areolate*, undulato-lobate ; apothecia black, minute, immersed ; ostiolum sub-hemispherical, slightly prominent ; epithecium poriform, dilated ; perithecium entire, thin, membranaceous, black ; spores 8, colourless, narrow-oblong, simple, sometimes pseudo-bilocular ; paraphyses indistinct ; gelatina hymenea vinous-red with iodine.

On the earth in alpine regions, rare. 1808.

SYN :—Ach. Prodr. 18. (1798.) Syn. 98. Nyl. Pyren. 17. Scand. 267. *Sagedia cinerea*, Leight. Ang. Lich. 22. Mudd Man. 268.
FIG :—E. Bot. t. 2013. Hepp Sporen t. 24. f. 221. f. 1.
EXS :—Schær. 647. Hepp 221. Fellm. 212. Zw. 103. Larbal. 96.
GEOG. DISTRIB :—Germany, Sweden, E. Lapland, Hungary, Switzerland, N. America.
BOT. PROV :—1...10 ..15...18...31.

ENGLAND :—Malham, Yorkshire. *Dr. Carrington.* Land's End. *Mr. Holmes.*
SCOTLAND :—Burgh Head in Island of Stronsa! Orkneys. *Messrs. Borrer & Hooker.* (1808.) summit of Ben Lawers! *Mr. Borrer.* Craig Guie. *Rev. J. M. Crombie.*
IRELAND :—Cleghan, Connemara. *Mr. Larbalestier.*
CHANNEL ISLANDS :—Grosnez Common, Jersey. *Mr. Larbalestier.*
"Spores .003 to .004 in. long, by .0015 to .00175 in. broad." *(Mudd.)* "Spores .016–23 mm. long, .007—.010 mm. broad." (*Nyl.*) Spores .020—.0225 mm. long, .009—.011 mm. broad.

Var. *cartilaginea*, Nyl. cinereo-pallescent or fuscescent, squamulæ firmer, sub-imbricate, sub-lobate, like the thalline leaflets of *Cladonia pyxidata v. pocillum ;* perithecium colourless.

On the earth, rare. 1866.

SYN :—Nyl. Coll. Gall. Mer. Pyr. 8. (1853.) Pyren. 18. Scand. 268. Carroll in Seem. Journ. Bot. 4. 34.
EXS :—Körb. 97. Arn. 78.
GEOG. DISTRIB :—Germany, Pyrenees, Sweden, Bavaria.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Mr. Carroll.* (1866.)

B. *Spores* 1-*septate.*

* *Perithecium dimidiate.*

36. *V. cataractarum*, (Mudd.) *greyish-green*, very thin, *sub-leprose or evanescent ; apothecia nigro-fuscous, minute*, nearly sessile, *sub-globose*, internally pale ; *perithecium dimidiate* ; paraphyses none ; spores 8, colourless, elliptico-oblong, 1-septate, moderate ; gelatina hymenea vinous-red with iodine.

On rocks in streams, rare.

SYN :—Mudd Man. 294. excl. syn. (1861.)
EXS :—Mudd 281.
GEOG. DISTRIB :—Europe
BOT. PROV :—6...10...19...23.
ENGLAND :—Near Ayton! Cleveland. *Mr. Mudd.*
IRELAND :—Rosscarbery, Cork ; Connor Cliffs and Blackwater Bridge, Kerry. *Mr Carroll.* Portrane. *Dr. Moore.*
WALES :—Moel-y-gest!
"Spores .005 to .008 in. long, by .002 to .00275 in. broad." *(Mudd.)* Spores .021 mm. long, .015 mm. broad.

37. *V. mesotropa*, Nyl. *pale*, thin, unequal ; *apothecia black*, somewhat *turgid* ; *perithecium convex, dimidiate*, black ; epithecium indistinct ; spores 8, colourless, ovoid or ovoideo-oblong, 1-septate, *very small* ; paraphyses none ; gelatina hymenea vinous-red with iodine.

On sub-alpine rocks, rare. 1866.

SYN :—Nyl. Flora 1866. p. 419 Leight. in Ann. and Mag. Nat. Hist. June 1867.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5...7.
ENGLAND :—Llanymynech Hill! Shropshire.
WALES :—Llyn Aran! Cader Idris. (1866.) Trefriw!
"Spores .012—17 mm. long, .005—6 mm. broad." *(Nyl.)* Spores .014—.017 mm. long, .004— 006 mm. broad.

38. *V. Borreri*, Leight. *smoky-grey*, somewhat pruinose, tartareous, continuous or rimulose, nigro-fusco-limitate ; *apothecia* black, *hemispherical, truncate, prominent*, basally immersed, rather

*large*, internally pale-brown; *epithecium depresso-concave, surrounded by a narrow edge and central papilla*; *perithecium* very thick, black, *dimidiate*, inner tunic brown; paraphyses distinct; filaments ostiolaria distinct, short, minute; spores 8, colourless, broadly or rotundo-oblong or elliptical, 1-septate, coarsely granular.

On calcareous rocks, rare. 1833.

SYN:—Leight. Ang. Lich. 76. & 51. (1851.) Mudd Man. 296.
FIG:—E. Bot. Suppl. 2791. Leight. Ang. Lich. t. 22. f. 4.
GEOG. DISTRIB:—Europe.
BOT. PROV:—1...15.
ENGLAND:—Chedder! *Mr. Borrer.*
SCOTLAND:—Ben Lawers. *Adm. Jones.* Morrone. *Rev. J. M. Crombie.*
"Spores .005 to .006 in. long, by .002 to .00275 in. broad." *(Mudd.)* Spores .030—.034 mm. long, .017—.020 mm broad.

39. *V. conoidea*, Fries. *greyish, more or less tinged with rose*, tartareous, thin, somewhat powdery, continuous or rimulose, indeterminate; *apothecia* dull-brownish-black, pruinose, large, prominent, *hemisphærico-conical*, slightly basally immersed, internally white; ostiolum rugulose; *epithecium papillate, minutely poriform, irregularly dehiscing*; *perithecium* black, thinnish, *dimidiate, spreading considerably at the base*, inner tunic pale; paraphyses distinct, slender; spores 8, colourless, oblong or broadly ellipsoid, 1-septate, yellow or brownish with iodine.

On calcareous rocks, frequent.

SYN:—Fries L. Ref. 432. (1831.) Nyl. Pyren. 53. Scand. 280. *V. epipolæa*, Leight. Ang. Lich. 61.
FIG:—E. Bot. Suppl. t. 2647. f. 3. Leight. Ang. Lich. t. 26. f. 2.
EXS:—Leight. 31. Mass. 319. Hepp 697. Anzi Lang. 239. Zw. 246. Fries 356. Mudd 284.
GEOG. DISTRIB:—Europe, Italy, Sweden, Hungary, Bavaria, Austria, Germany, Switzerland, France, Algeria.
BOT. PROV:—1...5...7...10, 11...15, 16...(19—26—30).
ENGLAND:—St. Vincent's Rocks, Bristol. *Mr. Borrer.* North of England. *Rev. J. Harriman.* Craig-y-Rhiw! Oswestry! *Rev. T. Salwey.* Bath! *Mr. Broome.* Torquay! *Dr. Deakin.* Airyholme Wood! Ingleby! Pinchingthorp Wood! Cleveland. *Mr. Mudd.* Ingleborough. *Dr. Carrington.* Bilsdale, Yorkshire. *Mr. Baker.* Leigh Woods, Clifton. *Mr. Larbalestier.* Bishopstowe, Torquay. *Mr. Parfitt.* near Cirencester. *Mr. W. Joshua.* Saltwood Castle near Hythe. *Mr. Holmes.* Craigforda! Llanymynech Hill! Norton Camp! Shropshire.
SCOTLAND:—Appin! Craig Guie. *Rev. J. M. Crombie.*
IRELAND:—Common. *Mr. Carroll.* Ballynakill! Galway. *Mr. Larbalestier.*
WALES:—Great Orme's Head! Eglwyseg rocks!
"Spores .004 to .006 in. long, by .0015 to .0025 in. broad." (*Mudd.*) "Spores .011—21 mm. long, .008—.010 mm. broad." (*Nyl.*) Spores .015—.018 mm. long, .009 mm. broad.

40. *V. immersa*, Leight. *white or pale-dirty-yellow or grey-ashy-white*, very thin, *tartareo-farinose; apothecia* black, *deeply incavato-immersed in the rock*, moderate, internally brownish; *ostiolum depressed;* epithecium poriform; *perithecium dimidiate*, thick, carbonaceous, flattened, inner tunic black; paraphyses none; *spores* 8, colourless, lineari-oblong, *constantly* 1-*septate*, large; gelatina hymenea red with iodine.

On calcareous rocks, frequent.

SYN:—Leight. Ang. Lich. 57. (1851.) Mudd Man. 295.
FIG:—Leight. Ang. Lich. t. 25. f. 2.

EXS :—Mudd 283. Schær. 103.
GEOG. DISTRIB :—Switzerland, Pyrenees, N. Zealand.
BOT. PROV :—1, 2...5...10, 11...15...19...30.
ENGLAND :—Sussex! *Mr. Borrer.* Craigforda! near Oswestry, Shropshire. *Rev. T. Salwey.* Bilsdale! Yorkshire. *Mr. Mudd.* Torquay! Devon. *Dr. Deakin.* Barnard Castle! Durham. *Mr. Robertson.* Ingleborough. *Dr. Carrington.* Craig-y-rhiw! Shropshire.
SCOTLAND :—N. W. slope of Morrone. *Adm. Jones.* Canlochan. *Rev. J. M. Crombie.*
IRELAND :—Belfast. *Mr. Thompson.* Sunday's Well! Cork. *Mr. Carroll.* White Park, Antrim. *Dr. Moore.* Ardglass, co. Down. *Dr. Maingay.* Killarney. *Dr. Carrington.*
"Spores .005—.007 in. long, .002 to .00275 in. broad. t. 5. f. 123." (*Mudd.*) Spores .029—.032 mm. long, .011—.012 mm. broad.

41. *V. saxicola,* Mass. *grey-ashy-white,* effuse, *pulverulent,* thin, *apothecia black* and shining, *very minute, semi-immersed*; ostiolum conico-hemispherical, papillate; epithecium poriform, minute; *perithecium dimidiate, carbonaceous; paraphyses none; spores* 8, *colourless, elongato-lineari-oblong,* 1-*septate, slightly constricted, cells binucleolate.*

On calcareous and oolitic rocks, probably frequent. 1876.

SYN :—Mass. Symm. 107. (1855.)
GEOG. DISTRIB :—Italy.
BOT. PROV :—5.
ENGLAND :—near Sapperton! Duntisborne! Gloucestershire. *Mr. Joshua.* (1876.)
Gelatina hymenea I lutescent, asci and spores fuscous. Spores .02—.021 mm. long, .005—.0055 mm. broad.

42. *V. sublitoralis,* Leight. *thallus evanescent; apothecia black and shining,* minute, *hemispherical,* scattered; *epithecium poriform; perithecium dimidiate,* black; *paraphyses few, distinct;* spores 8, colourless, lineari-ovoid or oblong, obtuse, 1-septate, constricted, minute.

On limpet shells *(Chthamalus stellatus)* on submerged maritime rocks, rare. 1857.

GEOG. DISTRIB :—Europe.
BOT. PROV :—1.. 3...6.
ENGLAND :—Sandgate! near Folkestone. *Mr. Currey.* (1857.) between Seaton and Beer! on south coast of Devon. *Mr. Parfitt.*
WALES :—Caswell Bay! Mumbles. Goodwick Bay! Manorbeer! and Giltar Point! near Tenby.
Spores .016 mm. long, .007 mm. broad.

43. *V. halizoa,* Leight. *nigricanti-macular,* thin, almost evanescent, effuse; *apothecia black and shining,* minute, *hemispherico-conoid,* scattered; *epithecium poriform, often irregularly chinky; perithecium* black, *dimidiate, incurved, nearly entire*; *paraphyses none*; spores 8, colourless, very minute, lineari-ellipsoid or oblong, imperfectly and faintly 1-septate, binucleolate; gelatina hymenea yellow with iodine.

On submerged maritime rocks, rare. 1851.

GEOG. DISTRIB:—Europe.
BOT. PROV :—6...14.
SCOTLAND :—Joppa! near Portobello! Newhaven! near Leith, Edinburgh. *Dr. Greville.* (1851.)
WALES :—Caswell Bay! Mumbles. Giltar Point! Manorbeer
Spores .010 mm. long, .005 mm. broad.

44. *V. elaina*, Borr. *greenish-olive*, very thin, tartareous, smooth or rimulose; *apothecia innate and covered by the thallus, eventually erumpent, innato-sessile*, hemispherico-conical; ostiolum black, more or less denuded; *epithecium* rather *large*, poriform, *umbilicate*; *perithecium dimidiate*, spreading and *acutely incurved at the base*; spores 8, colourless, linear-oblong, 1-septate.

On maritime slaty rocks, rare. 1812.

Syn:—Borr. under E. Bot. Suppl. 2623. f. 2. (1830.) Leight. Ang. Lich. 43. Mudd Man. 296.
Fig:—E. Bot. t. 2655. Leight. Ang. Lich. t. 27. f. 2.
Geog. Distrib:—Europe.
Bot. Prov:—7...24...36.
Ireland:—Western parts! *Miss Hutchins.* (1812.)
Wales:—Aber Ty Gwyn! near Dolgelley. *Rev. T. Salwey.*
Spores .017—.019 mm. long, .006—.007 mm. broad.

45. *V. fluctigena*, Nyl. *fuscous*, sub-opake, thin, continuous or rimose; *apothecia* scarcely prominent, *depressed*; perithecium black, dimidiate; spores 8, colourless, oviform, 1-septate; paraphyses moderate, irregular, (not crowded); gelatina hymenea I—.

On maritime calcareous rocks washed by the waves. 1874.

Syn:—Nyl. in Flora 1875. p. 14.
Geog. Distrib:—Western France.
England:—*Rev. J. M. Crombie.*
"Spores .013—15 mm. long, .006—7 mm. broad. Distinct by the smaller spores and paraphyses from *V. consequens*, Nyl. of which, however, it may be a subspecies." (*Nyl.*) Spores .016 mm. long, .007 mm. broad. Ascus linear-oblong, suddenly contracted and curved into a short narrow base. Paraphyses few, floccose or branched.

46. *V. gemmata*, Ach. *white or whitish*, thin, continuous, nearly smooth, sometimes rimulose; *apothecia black, large*, slightly immersed at the base, *very prominent, hemispherical, convex*, rugged, internally whitish; epithecium minute, poriform; *perithecium* thickish, black, *dimidiate*, inner tunic pale-brown; paraphyses distinct, long and slender; *spores* 8, colourless, *very broadly oblong*, 1-*septate*, *large*; spores and contents of asci yellow with a vinous tinge with iodine.

On trees, ash, sycamore, elm, holly, common. 1829.

Syn:—Ach. Meth. 120. (1803.) L. U. 278. Syn. 90. Nyl. Pyren. 53. Leight. Ang. Lich. 43. Mudd Man. 297.
Fig:—E. Bot. Suppl. t. 2617. fig. 2. Leight. Ang. Lich. t. 18. f. 4. & 5.
Exs:—Leight. 136. Zw. 31. Nyl. 93. M. & N. 1064. Mudd 285. Hepp 104. Bohl. 114. Schær. 105.
Geog. Distrib:—Germany, France, Switzerland, Scandinavia, Hungary, Italy, N. America, Algeria, Brazil.
Bot. Prov:—1, 2, 3...5..7...11...19..31.
England:—Sussex! *Mr. Borrer.* (1829.) Plymouth. *Mr. Holmes.* Ragley Woods, Warwickshire. *Rev. W. S. Rufford.* Malvern. *Mr. Lees.* Ayton! Airyholme Wood! Cleveland. *Mr. Mudd.* on the Derwent, Durham and Northumberland. *Mr. Winch.* Llanforda, Shropshire. *Rev. T. Salwey.* Hartshill Hays! Warwickshire. *Rev. A. Bloxam.* Kings Kerswell near Torquay. *Mr. Parfitt.* Kelvedon, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* near Cirencester. *Mr. W. Joshua.* Otford, Halstead, Kent. *Mr. Holmes.* Abdon! Loppington! Holly Park! near Stokesay, Shropshire.
Ireland:—Goat Island! Dyke! Dunkettle! Cork. *Mr. Carroll.*
Wales:—Near Dolgelley! Gloddaeth! Carnarvonshire. Llanbedrog!
Channel Islands:—Jersey and Guernsey. *Mr. Larbalestier.*

"Spores .0035 to .004 in. long, by .00175 to .002 in. broad." (*Mudd.*) "Spores .012—27 mm. long, .006—.012 mm. broad." (*Nyl.*) Spores .021—.025 mm. long, .0115—.013 mm. broad.

47. *V. conformis*, Nyl. *albido-virescent*, thin, effuse; apothecia black, small, semi-immersed; ostiolum hemispherical; epithecium poriform, minute; *perithecium dimidiate*; paraphyses very long, slender, distinct; asci lineari-clavate; spores 8, colourless, lineari-ellipsoid, 1-septate, constricted in the middle.

On trees, oak, gorse, elder, poplar, in sub-alpine regions, very rare. 1864.

SYN :—Nyl. in Flora 1864. p. 257. Crombie En. 119.
GEOG. DISTRIB :—France.
BOT. PROV :—6, 7...19...31.
IRELAND :—Upper Lake, Killarney. *Mr. Carroll.* (1864.) Ballinahinch! co. Galway. *Mr. Larbalestier.*
WALES :—Trefriw! Dolgelley! Fort Hill! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—Millbrook, Jersey! *Mr. Larbalestier.*
Very similar in general appearance to *V. biformis*, but differing by the above characters. The spores are in single series, with a tendency to separate at the constriction in the middle, the contents of the cells have a tendency to separate into two nuclei, and to become spuriously septate and even distinctly 3-septate. Spores .015—018 mm. long, .005—.007 mm. broad.
A form (f. *rhypontoides*. Nyl.) occurs with thallus dark-bluish-black at Noirmont, Jersey. *Mr. Larbalestier.*

48. *V. epidermidis*, Ach. *pale-yellow*, very thin, smooth and shining; *apothecia* black, minute, *sub-innate, sessile, hemispherico-conoid; perithecium dimidiate, depressed and spreading at the base; paraphyses* more or less *indistinct*; spores 8, colourless, lineari-oblong, 1-septate, constricted, moderate.

On birch, common.

SYN :—Ach. L. U. 276. (1810.) Syn. 89. Leight. Ang. Lich. 40. Mudd Man, 303.
FIG :—Leight. Ang. Lich. t. 17. f. 3.
EXS :—Nyl. 148. Anzi 384. Bohl. 63.
GEOG. DISTRIB :—Throughout the World.
BOT. PROV :—1, 2...5...7...10, 11...15...(19—30)...31.
ENGLAND :—Sussex! *Mr. Borrer.* New Forest; Epping Forest. *Rev. J. M. Crombie.* Oswestry! *Rev. T. Salwey*, Ayton! Cleveland. *Mr. Mudd.* Midland Counties. *Mr. Purton.* Ragley Woods, Warwickshire. *Rev. W. S. Rufford.* Northumberland and Durham. *Mr. Winch.* Plymouth. *Mr. Holmes.* near Cirencester. *Mr. W. Joshua.* in various places near Shrewsbury!!
SCOTLAND :—Highlands, frequent. *Rev. J. M. Crombie.*
IRELAND :—Common. *Mr. Carroll.*
WALES :—Woods opposite Tanybwlch Hotel, Capel Curig!
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
Spores .020—.021 mm. long, .0045—.005 mm. broad.

Var. *analepta*, Ach. dark-olive or copper-coloured.

On oak, ash, birch, hazel, common.

SYN :—Ach. Meth. 119. (1803.) Leight. Ang. Lich. 40. Mudd Man. 304.
FIG :—E. Bot. t. 1848.
GEOG. DISTRIB :—Throughout the World.
BOT. PROV :—1...5...10...19...31.
ENGLAND :—Ross Hall,! Shropshire. *Prof. Ch. Babington.* Cliffrigg! Hobhole! Cleveland. *Mr. Mudd.* Haldon, Exeter. *Mr. Parfitt.* Midland Counties. *Mr. Purton.* various places near Shrewsbury, Shropshire!
IRELAND :—Dunscombe's Wood! Glanmire! Cork. *Mr. Carroll.*
CHANNEL ISLANDS :—Common on all the Islands. *Mr. Larbalestier.*
"Spores .005 in. long, by .0015 in. broad." (*Mudd.*) Spores .019 mm. long, .006 mm. broad.

forma *fallax*, Nyl. similar to *analepta*, but with very distinct paraphyses.

On oak, mountain-ash, crab, birch, sweet-chestnut, &c., common.

SYN :—Nyl. Obs. Holm. 1852. p. 178. Scand. 281. Mudd Man. 303.
EXS :—Fellm. 221. 222. Leight. 29. Mudd 292. Bohl. 66. Körb. 295.
GEOG. DISTRIB :—Europe, Scandinavia.
BOT. PROV :—1, 2, 3 5 . 7...10...31.
ENGLAND :—Sussex ! *Mr. Borrer.* Hobhole ! Cleveland. *Mr. Mudd.* Leigh Woods, Clifton. *Mr. Larbalestier.* Stoke Wood, Exeter. *Mr. Parfitt.* Mile End near Colchester, Essex. *Mr. 'Varenne.* Nesscliffe Hill ! Haughmond Hill ! Norton Camp ! Shropshire.
WALES :—Moel-y-Golfa ! Montgomeryshire ; Capel Curig ! Gwydir woods ! Bettws-y-coed. Trefriw ! Beddgelert ! Dolgelley !
CHANNEL ISLANDS :—Jersey. *Mr. Larbalestier.*
"Spores .005 to .006 in. long, by .00175 to .002 in. broad. t. 5. f. 126." (*Mudd.*) Spores .020—.022 mm. long, .007 mm. broad.

Var. *cinereo-pruinosa*, Schær. *cinereo-rufescent or cream-coloured*, thin, effuse ; *apothecia* hemispherical, minute, *innate, thinly covered with the thallus, giving them a cinereo-pruinose appearance*, sometimes naked ; perithecium dimidiate ; paraphyses slender, distinct ; spores 8, colourless, in form and size as in *V. epidermidis*.

On various trees, elder, holly, not common.

SYN :—Schær. Spicil. 342. (1836.) Enum. 221. Mudd Man. 305.
FIG :—Hepp Sporen t. 13. f. 105. 106. 107.
EXS :—Arn. 133. 373. Hepp 105. 106. 107. Mudd 297. Anzi Langob. 437. Venet. 129. Zw. 420. Leight. 197.
GEOG. DISTRIB :—Switzerland, France, Pyrenees, Italy, Germany.
BOT. PROV :—1...5...7...10...(19—30.)
ENGLAND :—Near Ayton ! Cleveland. *Mr. Mudd.* Ilsham Wood near Torquay, Devon. *Dr. Deakin.* Malvern. *Mr. Lees.* Cirencester. *Mr. Joshua.*
IRELAND :—Frequent. *Mr. Carroll.*
WALES :—Near Dolgelley ! Trefriw !
Spores .020—.021 mm. long, .006 mm. broad.

49. *V. analeptella*, Nyl. Similar to *V. epidermidis f. analepta*, but with the paraphyses soft, distinct, though but slightly evolute. Distinguished from *V. fallax* by the smaller apothecia and different thecæ and spermatia.

On trees, frequent.

SYN :—Nylander in Flora 1872. p. 363.
EXS :—*Sagedia œnea*, Anzi L. min. r. 395.
IRELAND :—*Mr. Carroll.*

50. *V. analeptiza*, Nyl. very similar externally to *analepta ;* spores 1-or spuriously 3-5-septate ; paraphyses lax.

On trees, rare. 1867.

SYN :—*V. analeptiza*, Nyl. in Flora 1873. p. 300. *V. analeptica*, Nyl. in Flora 1876. p. 578. *V. analeptoides*, Nyl. in Flora 1867. p. 180. Carroll in Seem. Journ. Bot. 5. 260.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...26, 27.
IRELAND :—Turk Mount, Killarney ; Loughcooter, co. Galway. *Mr. Carroll.* (1867.) Doughruagh Mountain ! *Mr. Larbalestier.*
"Spores .036—50 mm. long, .009—.010 mm. broad." (*Nyl.*)

51. *V. cinerea*, (Pers.) *greyish-olive*, thin, continuous, smooth ; *apothecia black*, small, numerous, *innato-sessile*, hemispherico-convex ; *perithecium dimidiate, incurved at the base ;* paraphyses dis-

tinct; *spores* 8, colourless, elongato-oblong, slightly tapered towards each extremity, 1-septate, constricted, *large*, 4 times the size of those of *V. epidermidis.*

On trees, holly, elm, ash, not frequent. 1808.

SYN :—Pers. in Ust. Ann. st. 7. p. 28. (1794.) Leight. Ang. Lich. 39. Mudd Man. 305.
FIG :—E. Bot. t. 1891. Leight. Ang. Lich. t. 17. f. 2.
EXS :—Leight. 343. Mudd. 295.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2, 3...5...7...10...19.
ENGLAND :—New Forest, Hants. *Mr. Lyell.* (1808.) Sussex. *Mr. Borrer.* Essex. *Mr. Piggott.* Oswestry! *Rev. T. Salwey.* Kildale! Newton Wood! Easby! Lanbraughrigg! Westerdale! Cleveland. *Mr. Mudd.* Whitstone, Exeter. *Mr. Parfitt.* near Kemble! Glostershire. *Mr. Joshua.* Haughmond Hill! Shropshire.
IRELAND :—Glengariff! Cusquinny Goat Island! Old Court! near Cork. *Mr. Carroll.*
WALES :—Torrent Walk! Dolgelley. Moel-y gest!
"Spores .005 in. long, by .001 in. broad." (*Mudd.*) Spores .030—.0335 mm. long, .010 mm. broad.

52. *V. Laburni*, Leight. *brown or brownish-black*, thin, smooth, *effuse; apothecia* black and shining, *minute, semi-immersed.* hemispherical; *perithecium dimidiate;* epithecium minute, poriform; paraphyses indistinct; *spores* 8, colourless, *linear*, 1-*septate, constricted, cells binucleolate;* gelatina hymenea yellow with iodine.

On laburnum, oak and alders, rare. 1854.

SYN :—Leight. Exs. 254. (1856.)
EXS :—Leight. 254.
GEOG. DISTRIB :—Europe.
BOT. PROV :- 5...7...10...19.
ENGLAND :—Ayton! Cleveland. *Mr. Mudd.* (1854.) Stableford! near Bridgnorth, Downton Castle woods! Shropshire.
IRELAND :—Dromore! Kerry. *Mr. Carroll.*
WALES :—Craig Breidden, ! Montgomeryshire. Trefriw! Capel Arthog!
Spores .020—.025 mm. long, .005 mm. broad.

53. *V. antecellens*, Nyl. *albido-cinerascent*, thin, smooth and shining, effuse; *apothecia black*, numerous, *minute, crowded*, hemispherical, *surrounded at the base with the thallus;* ostiolum more or less naked; *perithecium dimidiate*; paraphyses none; *spores* 8, colourless, *elongato-lineari-oblong*, 1-septate, large; asci and spores red with iodine.

On trees, oak, sycamore, beech, ivy, holly, rare. 1865.

SYN :—Nyl. in Flora 1866. p. 86. Crombie En. 119.
FIG :—Grevillea l. t. 4. f. 2.
EXS :—Zw. 363. A. Hepp 954.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2...7...9...26.
ENGLAND :—Ivy Bridge, Devon; Tilgate Forest! Sussex. *Mr. Larbalestier.* (1865.) New Forest, Hants. *Rev. J. M. Crombie.* Parkgate! Cheshire.
IRELAND :—Between Clifden and Roundstone! Doughruagh! co. Galway. *Mr. Larbalestier.*
WALES :—Gwydir woods! Bettws-y-coed. Llyn Gwernan!
"Spores .032—35 mm. long, .009—.011 mm. broad." (*Nyl.*) Spores .0275—.028 mm. long, .0075 mm. broad.

54. *V. cinerella*, Flot. *pale-whitish-brown or albido-cinerascent*, thin, smooth, effuse; *apothecia black, minute, sub-innato-sessile, hemispherico-conoid; perithecium dimidiate*, black; epithecium a

depressed pore; *paraphyses indistinct; spores* 8, *fuscous*, oblong, 1-septate, constricted; gelatina hymenea brownish with iodine.

On trees, holly, beech, birch, rare. 1864.

SYN:—Flot. in Zw. EXS. Nyl. Scand. 281. Carroll in Seem. Journ. Bot. vol. 3. 293. *V. micula*, Flot.
FIG:—Hepp Sporen t. 13. f. 108.
EXS:—Zw. 37. 217. 110. Anzi Ital. S. 381. Hepp 108.
GEOG. DISTRIB:—Germany, Italy, Switzerland, France, Lapland, Amazons.
BOT. PROV:—2...5...7...19...26.
ENGLAND:—New Forest, Hants. *Rev. J. M. Crombie.* Sapperton, Gloucestershire. *Mr. Joshua.*
IRELAND:—Glengariff, Cork; Glencar; Loch Inchiquin! Kerry; Dinis, Killarney; Glenbower Wood, Killeagh; Eagle's Nest. *Mr. Carroll.* (1864.) Ballinahinch! Kylemore! co. Galway. *Mr. Larbalestier.*
WALES:—Chirk Castle Park!
"Spores .015—25 mm. long, .007—9 mm. broad." (*Nyl.*) Spores .020—.021 mm. long, .0065 mm. broad.

Var. *megaspora*, Nyl. spores double the size of those of the type; paraphyses branched.

On trees, beech, holly, rare. 1868.

SYN:—Nyl. in Flora 1868. p. 348. Crombie En. 121.
GEOG. DISTRIB:—France.
BOT. PROV:—2...7.
ENGLAND:—Near Lyndhurst! New Forest, Hants. *Rev. J. M. Crombie.* (1868.)
WALES:—Trefriw!
"Spores .023—36 mm. long, .009—.013 mm. broad." (*Nyl.*) Spores .035—.038 mm. long, .010 mm. broad.

55. *V. punctiformis*, Ach. *dark-olive or brown*, very thin, effuse; *apothecia* black and shining, *minute*, innato-sessile, *hemispherico-conoid, spreading at the base; perithecium dimidiate, incurved;* epithecium a rather large impressed pore; paraphyses none; *spores* 8, colourless, lineari-oblong, 1-septate, *very minute*.

On trees, oak, ash, hazel, alder, not common. 1812.

SYN:—Ach. Prodr. 18. (1798.) Leight. Ang. Lich. 41. Mudd Man. 305.
FIG:—E. Bot. 2412. Leight. Ang. Lich. t. 17. f. 5.
EXS:—Mudd 296. Leight. 344.
GEOG. DISTRIB:—Sweden, Germany, Switzerland, France.
BOT. PROV:—1, 2...5...7..10, 11...19...21.
ENGLAND:—Sussex! *Mr. Borrer.* (1812.) Cliffrigg! Hoggarts Wood! Ingleby, Cleveland. *Mr. Mudd.* Exeter. *Mr. Parfitt.* Eastbourne. *Mr. Roper.* Northumberland and Durham. *Mr. Winch.* Meole! near Shrewsbury; Hay Park! Herefordshire.
IRELAND:—White Point! near Queenstown; Cromaglown and Crogham, Killarney. *Mr. Carroll.* Armagh; Glengariff. *Adm. Jones.*
WALES:—Gwydir woods! Bettws-y-coed.
Spores .013—.015 mm. long, .004—.005 mm. broad.

forma *tremulæ*, Ach. albo-cinerascent, unequal, slightly rimulose; apothecia most minute, much crowded, sub-confluent, scarcely protuberant and surrounded at the base with the thallus.

On poplar, rare.
SYN:—Ach. L. U. 277. (1810.)
GEOG. DISTRIB:—Sweden, France, Spain, Switzerland, N. America.
BOT. PROV:—19.
IRELAND:—Old Dromore, Kerry. *Adm. Jones.*

forma *elongatula*, Nyl. like *V. punctiformis*, or *atomaria*, Ach. but with longer clavato-fusiform, 1-septate, spores; apothecia most minute; perithecium colourless in the lower part, paraphyses none.

On trees, rare. 1867.
SYN :—Nyl. in Flora 1868. p. 164. Crombie En. 120.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Dinis, Killarney. *Mr. Carroll.* (1867.)
"Spores .023– 33 mm. long, .005—6 mm. broad." (*Nyl.*)

forma *diminutula*, Nyl. apothecia most minute; spores oblong, 1-septate.

On trees, rare.
SYN :—Nyl. in Flora 1868. p. 164. Crombie En. 120.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Turk Mountain, Killarney. *Mr. Carroll.* (1867.)
"Spores .016—22 mm. long, .003—4 mm. broad." (*Nyl.*)

56. *V. nitescens*, Salw. *pale-brownish-white*, thin, *shining*, smooth or subrimulose, subdeterminate; *apothecia* black, *very minute*, numerous, *semi-immersed*, hemispherico-globose; *perithecium dimidiate, incurved at the base;* epithecium minute, poriform; paraphyses indistinct; *spores* 8, colourless, *linear*, 1-septate, *constricted, cells with* 2 *nuclei;* gelatina hymenea yellow with iodine.

On holly, rare. 1853.
SYN :—Salw. Obs. Penz. Lich. 140. (1853.) Mudd Man. 303.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1, 2—10.
ENGLAND :—Trevayler! Cornwall; New Forest. *Rev. T. Salwey.* (1853.) Hoggarts Wood; Ingleby; Westerdale, Cleveland. *Mr. Mudd.*
"Spores .004 to .005 in. long, by .001 to .00125 in. broad." (*Mudd.*) Spores .020 mm. long, .006 mm. broad.

57. *V. aphorisasa*, Strn. fuscous-black, macular, determinate; apothecia black, almost innate and hemispherical, congregate and crowded; perithecium dimidiate; spores 4-8, colourless, at length fuscous, oblong, 1-septate, rather large; paraphyses not very distinct, divaricato-ramose; gelatina hymenea I slightly blue or violet.

On bark and elm. 1874.
SYN :—Stirton in Grevillea 3. p. 36. (1874.)
BOT. PROV :—15.
SCOTLAND :—Near Grantown, Inverness. *Dr. Stirton.* (1874.)
"Spores .020—.028 mm. long, .005—7 mm. broad." (*Stirt.*)

58. *V. atomaria*, D.C. *cinerascent*, thin; *apothecia very minute, subglobose*, emerso-sessile, somewhat shining; epithecium umbilicate; perithecium dimidiate; spores 8, fuscous, broadly-oblong, 1-septate.

On hazel, probably not uncommon. 1876.
SYN :—D.C. Fl. Franç. 315. (1805.) Körb. S. L. 373. Par. 397.
EXS :—Arn. 147. Hepp 710.
GEOG. DISTRIB :—France, Germany, Switzerland.
BOT PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1876.)
Spores .0135 mm. long, .006 mm. broad.

** *Perithecium entire.*

59. *V. Taylori*, Carroll. *olivaceo-fuscescent*, thin, continuous or rimulose, rugulose, macular; *apothecia* black, *minute and very numerous*, semi-immersed, *acutely conical*, internally pale; epithe-

cium *papillate*, poriform; perithecium entire, black; paraphyses distinct, slender; *spores* 8, colourless, *fusiform*, 1-*septate*, *constricted*, *the cells very acute at the apices*, *with* 2 *or* 3 *nuclei*, *and having a tendency to break up or separate*; gelatina hymenea yellow with iodine, the spores brown.

On ash trees, rare. 1856.

SYN:—Nyl. Pyren. 82. (1858.) *Arthopyrenia*, Mudd Man. 302.
EXS:—Anzi Venet. 137.
GEOG. DISTRIB:—Dalmatia, Austria.
BOT. PROV:—19...25.
IRELAND:—Dunscombe's Wood! Cork; Clare Glen, Tipperary! *Mr. Carroll.* (1856.)
"Spores .005 to .006 in. long, by .001 in. broad." *(Mudd.)* "Spores .025 mm. long, .004 mm. broad." (*Nyl.*) Spores .030 mm. long, .005 mm. broad.

60. *V. colleta*, Strn. *black*, thin, continuous; *apothecia black*, *small*, *spherical*, *sometimes almost aggregate*; perithecium entire; epithecium poriform; spores 8, colourless, *fusiform*, often constricted at the middle, 1-septate, large; paraphyses very indistinct, almost conglutinate; gelatina hymenea within the asci, I vinous-red, the rest untinged.

On *Gymnomitrium concinnatum*, rare. 1874.

SYN:—Stirton in Grevillea 3. p. 37. (1874.)
BOT. PROV:—15.
SCOTLAND:—Ben Lawers. *Dr. Stirton.* (1874.)
"Spores .032—.045 mm. long, .01—.013 mm. broad." *(Stirt.)*

61. *V. capnodes*, Nyl. *dull-black*, tinged with grey or olive, roughish, *macular*, filmy, continuous; *apothecia black*, concolorous, roughish, *encrusted by the thallus*, minute, prominent, hemispherical, internally greyish; epithecium slightly papillose or umbilicate, poriform; *perithecium entire*, black; *spores* 8, colourless, linear-oblong, 1-*septate*, small.

On trees, rare. 1829.

SYN:—Nyl. in Flora 1867. p. 330. *V. rhyponta*, Leight. Ang. Lich. 37. Mudd Man. 303.
FIG:—E. Bot. Suppl. t. 2597. fig. 2. Leight. Ang. Lich. t. 16. fig. 1.
GEOG. DISTRIB:—Europe.
BOT. PROV:—2...10...19.
ENGLAND:—New Forest, Hants. *Mr. Lyell.* (1829.) Sussex! *Mr. Borrer.* Malham. *Dr. Carrington.* Hoggarts Wood and Easby Wood, Cleveland. *Mr. Mudd.*
IRELAND:—Castlebernard Park, Bandon. *Mr. Carroll.*
"Spores .003 to .004 in. long, by .00075 to .001 in. broad." *(Mudd.)* Spores .014—.015 mm. long, .005 mm. broad.

Var. *rhypontella*, Nyl. spores 1-septate, smaller.

On trees, very rare.

SYN:—Nyl. in Flora 1867. p. 374.
EXS:—Fries 253.
GEOG. DISTRIB:—Europe.
BOT. PROV:—19.
IRELAND:—Glenbower Wood, co. Cork. *Mr. Carroll.*
"Spores .014—20 mm. long, .004—5 mm. broad." *(Nyl.)*

62. *V. biformis*, Borr. *whitish or albido-cinerascent*, thin, continuous or rimulose, slightly rugose or smooth, somewhat pulverulent, indeterminate; *apothecia* black or brownish-black, small,

numerous, *semi-immersed*, prominent, internally pale; *ostiolum hemispherical*, dull or polished, rugulose; *epithecium poriform*, minute, impressed, *ultimately lacero-dehiscent; perithecium* thickish, black, *entire;* paraphyses very long, slender, distinct; spores 8, colourless, lineari-ellipsoid, 1-septate, cells with one or two nuclei; gelatina hymenea red with iodine.

On trees, ash, gorse, elm, oak, willow, common. 1829.

SYN :—Borr. in E. Bot. Suppl. 2617. (1829.) Leight. Ang. Lich. 37. Nyl. Pyren. 54. Mudd Man. 297.
FIG :—E. Bot. Suppl. t. 2617. f. 1. Leight. Ang. Lich. t. 16. f. 2. & 3.
EXS :—Leight. 100. Zw. 36. Nyl. 91. Mudd 286. Hepp 953.
GEOG. DISTRIB :—France, Germany, Switzerland, America.
BOT. PROV :—1, 2, 3, 4, 5, 6, 7, 8...10...19...31.
ENGLAND :—Sussex! *Mr. Borrer.* Torquay! Devon. *Dr. Deakin.* Gopsall! Leicestershire. *Rev. A. Bloxam.* Yoxall! Staffordshire. *Prof. Ch. Babington.* Malvern. *Mr. Lees.* Airyholme Wood! Ayton! Cleveland. *Mr. Mudd.* Clayton near Brighton. *Mr. Larbalestier.* Stoke Wood, Exeter. *Mr. Parfitt.* Kelvedon; Witham, Essex. *Mr. Varenne.* New Forest. *Rev. J. M. Crombie.* near Cirencester. *Mr. W. Joshua.* near Compton place, Eastbourne. *Mr. Roper.* Shelton Rough! Weir Coppice! near Shrewsbury; Haughmond Hill! Loppington! Raglith! Shropshire.
IRELAND :—Ardtully! co. Kerry. *Dr. Taylor.*
WALES :—Barmouth! Gwydir woods! Bettws-y-coed. Builth! Capel Arthog! Fishguard! Pembrokeshire.
CHANNEL ISLANDS :—Jersey and Guernsey. *Mr. Larbalestier.*
"Spores .0025 to .00325 in. long, by .001 to .0015 in. broad." *(Mudd.)* "Spores .010—16 mm. long, .005—7 mm. broad." *(Nyl.)* Spores .012 –.016 mm. long, .005—.006 mm. broad.

63. *V. Salweii*, Leight. *white or greyish-white*, thin, tartareo-farinose, nearly evanescent; *apothecia* black, *very large and prominent*, hemispherico-conical, *sessile*; ostiolum rugulose; *epithecium very large and open; perithecium entire*; paraphyses distinct, long, slender, flocculose; asci linear; spores 8, colourless, broadly and obtusely oblong, 1-septate, in size and form similar to those of *V. gemmata*.

On calcareous rocks, mortar, &c., not common. 1851.

SYN :—*V. Salweii*, Leight. in litt. 1851. Nyl. Prodr. 189. Mudd Man. 293.
GEOG. DISTRIB :—France.
BOT. PROV :—2...5...7...19...26.
ENGLAND :—Llanforda! near Oswestry, Shropshire. (1851.) Shanklin Church! Sandown! Isle of Wight. *Rev. T. Salwey.* Malvern. *Mr. Lees.* near Uckfield, Sussex. *Mr. Davies.*
IRELAND :—Riverstown! Cork. *Mr. Carroll.* Dawros river! co. Galway. *Mr. Larbalestier.*
WALES :—Harlech Castle! *Rev. T. Salwey.*
"Spores .005 to .006 in. long, by .002 to .0025 in. broad." *(Mudd.)* Spores .0235 mm. long, .011 mm. broad.

64. *V. spilobola*, Nyl. *black*, thin, evanescent; *apothecia black, small*, somewhat prominent, crowded or *submaculari-aggregate*, perithecium entire, black; spores 8, colourless, oviform or oblongo-oviform, slightly 1-septate; paraphyses none; gelatina hymenea not tinged with iodine.

On calcareous stones. 1871.

SYN :—Nylander in Flora 1872, p. 368.
BOT. PROV :—15.
SCOTLAND :—Craig Tulloch. *Rev. J. M. Crombie.* (1871.)
"The green gonidia are often 4-connate. Spores .015—.020 mm. long, .007—8 mm. broad." *(Nyl.)*

65. *V. litoralis*, Tayl. *pale-greenish-grey*, thin, tartareous, continuous; *apothecia* black and shining, numerous, crowded, sessile, the base only immersed in very slightly elevated portions of the thallus, *very prominent, sub-globose, truncato-conical; epithecium large*, depressed, *umbilicate; perithecium* thick, *entire;* paraphyses distinct; spores 8, colourless, oblong, 1-septate.

On maritime rocks, rare.

SYN:—*V. muralis var.* Tayl. Fl. Hib. 2. 92. (1836.) *V. litoralis*, Leight. Ang. Lich. 46.

FIG:—Leight. Ang. Lich. t. 20. f. 2.

GEOG. DISTRIB:—Europe.

BOT. PROV:—1...7...19...30, 31.

ENGLAND:—Mudstone, Devon. *Dr. Holl.*

IRELAND:—Kerry! Dunkerron! *Dr. Taylor.* (1836.) Glenarm, Antrim. *Adm. Jones.* Sunday's Well Weirs and Ballinhassy, Cork. *Mr. Carroll.*

WALES:—Aber-Ty-Gwyn near Dolgelley; Aberhamfre, Barmouth. *Rev. T. Salwey.*

CHANNEL ISLANDS:—St. Aubins Fort, Jersey. *Mr. Larbalestier.*

Spores .021 mm. long, .008 mm. broad.

66. *V. bryospila*, Nyl. fuscous-black, thin, opake; apothecia b'ack, prominent, sub-conical; epithecium impressed; *perithecium entire*, black; *paraphyses slender; spores* 8, 4 or 2, colourless, oblongo-ovoid, 1-septate; gelatina hymenea untinged with iodine.

On schistose earth, very rare. 1864.

SYN:—Nyl. in Flora 1864. p. 257.

GEOG. DISTRIB:—Norway.

BOT. PROV:—15.

SCOTLAND:—Ben Lawers. *Mr. Carroll.* (1864.)

"Spores .030—44 mm. long, .011—12 mm. broad." (*Nyl.*)

67. *V. arenicola*, Leight. *gelatinous* when wet, dusky-olive-green, evanescent when dry; *apothecia black, opake, hemispherical, semi-immersed, internally colourless; ostiolum hemispherical*, slightly depressed; *epithecium a minute depressed pore; perithecium black, entire;* paraphyses few, slender; *spores* 8, *colourless, oblongo-ovoid, 1-septate, cells filled with minute spherical granules.*

On wet sand-banks, rare. 1877.

BOT. PROV:—5.

ENGLAND:—Shelton Rough! near Shrewsbury. (1877.)

Spores .021—.022 mm. long, .008 mm. broad. Thecæ and spores I pale-fuscescent.

68. *V. rugulosa*, (Borr.) *apothecia* small, crowded, *prominent, semi-immersed, hemispherico-conical*, brownish-black; epithecium round, simple; perithecium entire; spores 8, dark-brown, oblong, 1-septate, minute.

On old walls, rare. 1850.

SYN:—*Verrucaria*, Leight. Ang. Lich. 47. (1851.) *Endococcus*, Nyl. Prodr. 193. *Microthelia*, Mudd Man. 306.

FIG:—Leight. Ang. Lich. t. 21. f. 1.

EXS:—Arn. 250.

GEOG. DISTRIB:—Pyrenees, Bavaria.

BOT. PROV:—1, 2..7.

ENGLAND:—Near Lewes! Sussex. *Mr. Borrer.* (1850.) Star Cross, Devon. *Mr. Parfitt.*

WALES:—Barmouth!

"Spores .00225 to .003 in. long, by .001 in. broad." (*Mudd.*) "Spores .007—.011 mm. long, .004—6 mm. broad." (*Nyl.*) Spores, 011 mm. long, .006 mm. broad,

69. *V. Larbalestierii*, Leight. *albido-glaucescent*, thin, tartareous, effuse, *minutely rimuloso-diffract, areolæ plane, smooth, somewhat shining*, bearing 1 or 2 apothecia in the centre of each areola, (K yellow C—); *apothecia black, moderately large, semi-immersed, internally nigro-fuscous;* ostiolum hemispherical, prominent, shining; epithecium a minute depressed pore; *perithecium black, entire; paraphyses none; spores* 8, *fusco-nigricant, oblong,* 1-*septate, minute.*

On granitic rocks, rare. 1877.

SYN :—Leight. in Linn. Trans. 2d. ser. 1. 242.
FIG :—Linn. Trans. l. c. t. 33. f. 15, 16, & 17.
BOT. PROV :—26.
IRELAND :—Near Kylemore! Galway. *Mr. Larbalestier.* (1877.
Gelatina hymenea I—. Spores .016 mm. long, .008—.0085 mm. broad.

### *C. Spores* 3-*septate.*

### * *Perithecium dimidiate.*

70. *V. rhyponta*, Ach. *fusco-nigrescent or fuliginous*, very thin, opake, *macular*, sub-effuse; apothecia minute, sessile, hemispherical; *perithecium dimidiate*, black; epithecium a minute pore; paraphyses none; *spores* 8, colourless, lineari-oblong, 3-*septate*, minute; gelatina hymenea red or yellow-brown with iodine.

On smooth barks of poplar, alder, &c., rare.

SYN :—Ach. L. U. 282. (1810.) Syn. 89. Nyl. Scand. 281. *V. fumago*, Wallr. Cr. Germ. 1. 298.
EXS :—Zw. 368, 34. Arn. 241. Anzi Venet. 121. 122. M. & N. 557. Schær. 591. 645. Leight. 254. Mudd 291.
GEOG. DISTRIB :—Germany, France, Switzerland, Italy, Sweden.
ENGLAND :—Near Ayton! Cleveland. *Mr. Mudd.*
SCOTLAND :—Killin, side of the Garry. *Rev. J. M. Crombie.*
IRELAND :—Dunkerron. *Dr. Taylor.* Deer Park. Glenarm. *Adm. Jones.*
"Spores .018—22 mm. long, .006—8 mm. broad." (*Nyl.*) Spores .015—.020 mm. long, .005 mm. broad.

71. *V. Cerasi*, Ach. *pale-yellow, fuscescent or fuscous*, thin, membranous, more or less shining, *maculari-determinate; apothecia very numerous and crowded, minute*, oblong or rounded, convex, shining; perithecium dimidiate, fuscous-black; paraphyses none; spores 8, colourless, lineari-oblong, 3-septate.

On young oaks, not common. 1871.

SYN :—Ach. L. U. 276. (1810.) Syn. 89. Nyl. Scand. 281. Leight. Ang. Lich. 41.
EXS :—Zw. 106. Schær. 644. Nyl. Pyr. Or. 50. Mass. 106.
GEOG. DISTRIB :—Germany, Italy, Pyrenees, Hungary, Liguria, Switzerland, Scandinavia.
BOT. PROV :—5.
ENGLAND :—Cowcombe! Gloucestershire. *Mr. Joshua.*
Well marked by the peculiar horizontal disposition of the apothecia and their singular elongato-horizontal form. Spores .019 mm. long, .006 mm. broad. "Spores .023—24 mm. long, .009 mm. broad." (*Nyl.*)

72. *V. submicans*, Nyl. *pale-rufous-brown*, thin, effuse; *apothecia black, hemispherical, convex, shining*, numerous, small, scattered; perithecium dimidiate; epithecium minutely poriform; paraphyses none; spores 8, colourless, lineari-oblong, 3-septate.

On trees, oak, birch, holly, cherry, common. (1871.)

SYN :—Nyl. in Flora 1872. p. 363.
BOT. PROV :—7...26.
IRELAND :—Doughruagh Mountain! Kylemore, co. Galway. *Mr. Larbalestier.* (1875.)
WALES :—Wood opposite Tan-y-bwlch Hotel! Capel Curig. Wood Glyn near Capel Curig! (1871.) Tremadoc! Capel Arthog!
"Spores .020—26 mm. long, .006 mm. broad." (*Nyl.*) Spores .0165—.017 mm. long, .006 mm. broad.

73. *V. rubella*, Nyl. thallus none; *apothecia pale-reddish* or rufescent, *tuberculoso-spherical*, prominent; *perithecium dimidiate*, colourless in lower portion; spores 100 or more, colourless, ellipsoid, 3-septate; paraphyses slender, elongate, articulate; filamenta ostiolaria distinct; gelatina hymenea vinous-red with iodine.

On trees, rare. 1866.

SYN :—*Thelopsis*, Nyl. Prodr. 196. (1857.) Crombie En. 123.
FIG :—Hepp Sporen t. 80. f. 707.
EXS :—Nyl. 98. Hepp 707. Zw. 50. Arn. 251.
GEOG. DISTRIB :—France, Germany.
BOT. PROV :—15...19.
SCOTLAND :—Lanrick Castle! near Doune, Perthshire. *Dr. A. McKinlay.* (1866.)
IRELAND :—Dinis Island, Killarney. *Mr. Carroll.*
"Spores .010—17 mm. long, .005—8 mm. broad." (*Nyl.*) Spores .015 mm. long, .006 mm. broad.

74. *V. affinis*, Mass. *cinereo-albescent*, effuse, smooth, or rugulose; *apothecia black*, minute, *at first immersed then prominent*, hemispherical; *perithecium dimidiate*; paraphyses distinct, slender; spores 6-8, colourless, *fusiform*, 3-septate.

On birch, walnut, holly. 1876.

SYN :—Mass. Mem. 138. Körb. Par. 357.
FIG :—Mass. Mem. t. 25. f. 169.
EXS :—Mass. Ital. 350. A. & B. Anzi Langob. 222. Zw. 316.
GEOG. DISTRIB :—Italy, Hungary, Germany.
BOT. PROV :—26.
IRELAND :—Near Letterfrack! Doughruagh Mountain! Connemara. *Mr. Larbalestier.* (1867.)
"Spores .0122—.0183 mm. long, .00244 to .00366 mm. broad." (*Mass.*) Spores .014—.021 mm. long, .004—.0045 broad.

75. *V. submiserrima*, Nyl. *glaucescent*, thin, effuse; *apothecia black, minute*, hemispherical, convex, *clustered on a small black patch*; perithecium dimidiate; paraphyses none; spores 8, colourless, lineari-oblong, 3-septate.

On holly, rare. 1875.

SYN :—Nyl. in Flora 1877. p. 291.
BOT. PROV :—5...7...26.
ENGLAND :—Downton Castle Woods! Shropshire. (1875.)
IRELAND :—Kylemore! *Mr. Larbalestier.* (1876.)
WALES :—Llyn Gwernan! Cader Idris!
"Spores .016—19 mm. long, .004—5 mm. broad." (*Nyl.*) Spores .018 mm. long, .005 mm. broad. Similar externally to *Mycoporum miserrimum.*

76. *V. chlorotica*, (Ach.) *olivaceo-fuscescent* or cinerascent, thin, *continuous, smooth, somewhat varnished or mucoso-gelatinous*; *apothecia black*, minute, sessile, sub-hemispherical, *convex, polished* and shining, *internally pale*; *perithecium dimidiate*; epithecium a minute depressed pore; paraphyses distinct; spores 8, colourless, fusiform, 3-septate; gelatina hymenea yellow or untinged by iodine.

On rocks and trees, frequent.

SYN :—Ach. Syn. 94. (1817.) Nyl. Pyren. 36. Scand. 277.
EXS :—Zw. 152. 153. Mudd 288. Leight. 138.
GEOG. DISTRIB :—Germany, Italy, Scandinavia, America, Polynesia.
BOT. PROV :—6, 7...10...26...31.
ENGLAND :—Near Ayton ! Ingleby ! Cleveland. *Mr. Mudd.*
IRELAND :—Cleghan ! and Dawros Bridge ! co. Galway. *Mr. Larbalestier.*
WALES :—Between Corwen and Bala ! Festiniog road ! near Dolgelley. Bettws-y-coed ! Conway falls ! Fishguard Harbour ! Moel-y-gest !
CHANNEL ISLANDS :—The Warren ! Noirmont, Jersey ; Jerbourg ! Guernsey. *Mr. Larbalestier.*
"Spores .018—23 mm. long, .005—6 mm. broad." (*Nyl.*) Spores .018 mm. long, .005 mm. broad.

forma *trachona*, (Tayl.) olive-green or cinerascent, tartareous, thin, continuous or rimulose, sometimes subpulverulent ; *apothecia internally nigro-fuscous.*

On sandstone rocks, frequent.

SYN :—Tayl. Fl. Hib. 2. 93. (1836.) Leight. Ang. Lich. 50. Mudd Man. 301.
FIG :—Leight. Ang. Lich. t. 22. f. 1, 2.
EXS :—Arn. 17. Mass. 348. Hepp 695.
GEOG. DISTRIB :—Bavaria, France, Pyrenees.
BOT. PROV :—1...8...19.
ENGLAND :—Torquay ! *Dr. Deakin.* near Buxton ! *Dr. Holl.* Batheaston ! *Mr. Broome.* Penzance ! *Rev. T. Salwey.*
IRELAND :—Derriquin ! Askew Wood ! *Dr. Taylor.*
Spores .021—.023 mm. long, .005 mm. broad.

forma *subintegra*, Nyl. *pale-cinereo-virescent*, thin, *tartareous, rimulose*, indeterminate ; apothecia moderate, somewhat convex and prominent, internally pale ; perithecium dimidiate, much incurved at the base ; spores 8, colourless, fusiform, 3-septate.

On granitic maritime rocks, rare.

SYN :—*V. subintegra*, Nyl. in Flora 1865. p. 212.
GEOG. DISTRIB :—Europe.
BOT. PROV :—6...26...31.
IRELAND :—Near Tully ! co. Galway. *Mr. Larbalestier.*
WALES :—Manoerowen ! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—Rozel ; Noirmont ! La Coupe ! Jersey. *Mr. Larbalestier.*
"Spores .020—27 mm. long, .006—7 mm. broad." (*Nyl.*) Spores .020 mm. long, .0045 mm. broad.

Var. *codonoidea*, Leight. *virescenti-olivaceous*, thin, tartareous, rimulose ; *apothecia* minute, black, polished, *hemispherical, depresso-conical, papillate ;* perithecium thin, dimidiate, *inner tunic black*, internally pale ; paraphyses distinct ; spores linear, narrowed and rounded at each extremity, colourless, 3-septate.

On rocks, rare. 1850.

SYN :—Leight. Ang. Lich. 53. (1850.) Mudd Man. 301.
FIG :—Leight. Ang. Lich. t. 23. f. 3.
GEOG. DISTRIB :—Italy.
BOT. PROV :—2...5...7, 8...10.
ENGLAND :—Isle of Wight ! *Rev. T. Salwey.* Laughraugh-rigg near Ayton. *Mr. Mudd.* Charnwood Forest ! Leicestershire. *Rev. Prof. Ch. Babington.* Weston-Super-mare. *Mr. Joshua.* Haughmond Hill ! (1850.) Craig-y-Rhiw ! Oswestry.
WALES :—Craig Breidden ! Trefriw ! Nevin !
Spores .018—.0195 mm. long, .005 mm. broad.

forma *carpinea*, Schær, *dark-opake-olive-green or brown*, thin, continuous, effuse ; *apothecia* minute, *black, polished* and shining,

sessile, internally pale; perithecium dimidiate; spores 8, colourless, fusiform, 3-septate.

On trees, mountain-ash, sweet chestnut, holly, calluna vulgaris, frequent.

SYN :—Schær. Spicil. 342. (1833.) *V. fusiformis*, Leight. Ang. Lich. 42. (1851.) Mudd Man. 301.
FIG :—Leight. Ang. Lich. t. 18. f. 2.
EXS :—Leight. 99. Mudd 289. Zw. 39. B. D. 40. 42. 43. Arn. 181. 242. M. & N. 855. Schær. 525. Bohl. 82. Rabh. 759. Nyl. 96.
GEOG. DISTRIB :—Germany, Bavaria, Switzerland, Sweden, France, Pyrenees.
BOT. PROV :—1, 2, 3...5, 6, 7, 8...10...19...26..28..31.
ENGLAND :—Sowerdale! Airyholme Wood! Newton Wood! Cliffrigg! Cleveland. *Mr. Mudd.* Yoxall! *Rev. Prof. Ch. Babington.* Red hills, Exeter. *Mr. Parfitt.* Colne Engaine, Essex. *Mr. Varenne.* Sussex! *Mr. Borrer.* Shelton Rough! near Shrewsbury. Norton Camp! Holly Park! near Stokesay. Castle Hill Plantation! near Acton Scott.
IRELAND :—Castlebernard Park! Bandon; Douglas near Cork; Dunscomb's Wood. *Mr. Carroll.* Armagh Demesne. *Adm. Jones.* Doughruagh Mountain! Kylemore Lake! Tullywee Bridge! co. Galway. *Mr. Larbalestier.*
WALES :—Barmouth! Gloddaeth! Carnarvonshire. Bettws-y-coed! Trefriw! Builth! Pen Cow! near Fishguard, Pembrokeshire.
CHANNEL ISLANDS :—Belcroute Bay, Jersey. *Mr. Larbalestier.*
Spores. 018—.020 mm. long, .0045 mm. broad.

77. *V. pyrenophora*, Ach. *mouse-coloured*, very thin, tartareous, *continuous or rimulose*, effuse, determinate; *apothecia black, large*, very prominent, sessile, *conoideo-sub-truncate*, internally pale; *perithecium dimidiate;* epithecium depressed, umbilicate; paraphyses none; *spores* 8, colourless, *broadly lineari-oblong*, 3-septate; gelatina hymenea vinous-red with iodine.

On alpine rocks, borders of lakes, and in running streams, rare.

SYN :—Ach. L. U. 285. (1810.) Syn. 94. Leight. Ang. Lich. 76. and 54.
FIG :—Leight. Ang. Lich. t. 23. fig. 4. 5. 6.
EXS :—Leight. 139. Arn. 131. Hepp 97. 98. Anzi Langob. 286.
GEOG. DISTRIB :—Switzerland, Sweden, Pyrenees, Austria, Hungary.
BOT. PROV :—1...5 ..7 ..11, 12...15...19...24 . 26...28.
ENGLAND :—Nent Force! Cumberland. *Mr. Robertson.* Hartlepool, Durham. *Mr. Mudd.* Starcross, Devon. *Mr. Parfitt.* Oaksey, near Cirencester. *Mr Joshua.* Craigforda! Shropshire.
SCOTLAND :—Ben Lawers and Craig Guie. Craig Tulloch. *Rev. J. M. Crombie.*
IRELAND :—Barnaghee Mountain! *Dr. Taylor.* Armagh. *Adm. Jones.* Rosscarberry, Cork; Dromoland, Clare; Ballaghbeama Gap! Kerry. *Mr. Carroll.* Ballynakill churchyard walls! Lough Muck! Lough Feagh! Galway. *Mr. Larbalestier.*
WALES :—Llyn Aran! Cader Idris. (simple, 1 & 3-septate) Trefriw falls!
"Spores .008 to .009 in. long, by 003 to .004 in. broad." *(Mudd.)* Spores .029—.043 mm. long, .016 mm. broad.

78. *V. microcarpa*, Dav. *whitish, farinose* or evanescent; *apothecia black, very minute*, solitary or congregated, hemispherical, sessile; *perithecium dimidiate*, black; epithecium poriform; paraphyses none; *spores* 8, colourless, broadly elliptico-oblong, 3-septate, ⅔ *less than those of pyrenophora*; gelatina hymenea vinous-red with iodine.

On chalk, rare.

SYN :—G. Davies MS. in Herb. Borrer.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2.

ENGLAND :—Horton Downs! Sussex. *Mr. Davies.*
Spores . 0265 -.0285 mm. long, .013—.014 mm. broad.

79. *V. linearis*, Leight. *greyish-white*, thin, tartareous, effuse; *apothecia* very minute, black, *hemispherical*, slightly immersed, internally pale; *perithecium* very thick, dimidiate, incurved at the base, inner tunic pale; *epithecium depressed, umbilicate;* paraphyses distinct; *spores* 8, colourless, *linear*, rounded at the extremities, 3-septate.

On calcareous rocks, rare.

SYN :—Leight. Ang. Lich 52. (1851.) Mudd Man. 300.
FIG :—E. Bot. Suppl. t. 2791. small *Verrucaria* in fig. 1. Leight. Ang. Lich. t. 23. f. 1.
GEOG. DISTRIB :—Europe.
BOT PROV :—1.
ENGLAND :—Chedder ![*Mr. Borrer.*
Spores .019-021 mm. long, .0035—.004 mm. broad.

80. *V. lectissima*, (Frs.) *pale-olive* or cinereous-olive or rufous, thin, continuous or rimulose, sub-tartareous, effuse; *apothecia pale-rufous or rufescent*, immersed *in prominent thalline verrucæ*, hemispherical, papillose; ostiolum more or less denuded; epithecium a rather large depressed pore; *perithecium dimidiate, rufous;* spores 8, colourless, fusiform, 3-septate; paraphyses distinct, slender; gelatina hymenea untinged with iodine.

On moist sub-alpine rocks, not frequent. 1836.

SYN :—*Segestrella*, Fries L. E. 430. (1831.) Nyl. Scand. 278. Mudd Man. 284. *V. irrigua & erysiboda*, Tayl. Leight. Ang. Lich. 56.
FIG :—Leight. Ang. Lich. t. 24. f. 4. & 6.
EXS :—Leight. 32. Anzi It. S. 394. Zw. 23. Larbal. 49. Schær. 235. Hepp 696.
GEOG. DISTRIB :—Pyrenees, Germany, Switzerland, Italy.
BOT. PROV :—1...7...16...18, 19...22 26...31.
ENGLAND :—Penzance! Cornwall. *Rev. T. Salwey.*
SCOTLAND :—Appin and Lerwick in Shetland. *Rev. J. M. Crombie.*
IRELAND :—Dargle River! co. Wicklow; Carig Mountain! Blackwater Bridge co. Kerry. *Dr.*[*Taylor.* (1836.) Turk Mountain; and Ballaghbeama Gap, Kerry. *Mr. Carroll.* Doughruagh! co. Galway. Lord Sligo's demesne, Westport! co. Mayo. *Mr. Larbalestier.*
WALES :—Arddog! Rhaiadr Mawddach! *Rev. T. Salwey.* Fridd-du! Aber Valley! Llyn Aran! and Llyn Cae! Cader Idris; Cell Fawr! Barmouth; Cwm Cywion! Glyder Vach; Llyn Cwlyd! Bettws-y-coed! Trefriw! Llyn Geirionyd! Capel Arthog! Craig Breidden!
CHANNEL ISLANDS :—Rozel Valley! Noirmont! Jersey. *Mr. Larbalestier.*
"Spores .005 in. long, by .00075 in. broad, t. 5. f. 120." (*Mudd.*) "Spores 023—27 mm. long, .0045—.0065 mm. broad." (*Nyl.*) Spores .026—.032 mm. long, .0055—.006 mm. broad.

Var. *leptalea*, (DR. & Mnt.) "apotheciis rufis, admixtis aliis infuscatis."

On trees, rare. 1864.

SYN :—*Biatora leptalea*, D. R. & Mont. Fl. Alger. 1 p. 268. (1846.) Mnt. Syll. 339. Nyl. Prodr. 187. Pyr. 38.
GEOG. DISTRIB :—Algeria, Aland, Norway.
BOT. PROV :—2...7 19...26, 27.
ENGLAND :—New Forest! *Rev. J. M. Crombie.*
WALES :—Wood opposite Tanybwlch Hotel, Capel Curig! Capel Arthog!
IRELAND :—Curraghmore, *Adm. Jones.* (1864.) Crosshaven, Cork; Killarney; Glenbower, Killeagh. *Mr. Carroll.* Delphi, Killery Bay, Connemara. *Mr. Larbalestier.*

81. *V. holochrodes*, Nyl. *ochraceo-reddish*, thin, *continuous*, indeterminate; *apothecium hemispherico-conical, covered by the thallus; perithecium pale-brown, dimidiate*; epithecium minute, poriform; *paraphyses distinct*, very slender and delicate; *spores* 8, colourless, *fusiform*, 3-*septate*.

On shady slaty rocks, rare. 1876.

SYN:—Nyl. in Flora 1876. p. 311.
BOT. PROV.—26.
IRELAND:—Killery Bay! Connemara. *Mr. Larbalestier*. (1876.)
"Similar to *V. lectissima* and probably a sub-species of it, differing especially in the colour of the thallus. Spores 023—34 mm. long, .005—6 mm. broad." (*Nyl.*) Spores .025 mm. long, .005 mm. broad.

82. *V. Harrimanni*, Körb. *cinereo-rufescent, tartareous, sublepprose; apothecia black, minute, globose*, at first *immersed*, then half-immersed; perithecium dimidiate; epithecium papillate; paraphyses slender; *spores* 8, colourless, *broadly and shortly fusiform*, 3-septate.

On rocks, rare. 1876.

SYN:—Körb. Syst. 362.
GEOG. DISTRIB:—Germany.
BOT. PROV.—26.
IRELAND:—Twelve Pins! Connemara. *Mr. Larbalestier*. (1876.)
Spores .021 mm. long, .006 mm. broad. Gelatina hymenea I—.

83. *V. tenuifera*, Nyl. *cinerascent*, thin, *rimulose*; apothecia *black, convex*; small; perithecium dimidiate; spores 8, colourless, ("bacilliform" Nyl.) acicular, 3-septate; paraphyses long and slender; asci lineari-acuminate.

On granite walls, rare. 1873.

SYN:—Nyl. in Flora. 1876. p. 237.
BOT. PROV:—31.
CHANNEL ISLANDS:—St. John's, Jersey. *Mr. Larbalestier*. (1873.)
"Spores .029—33 mm. long .0035 mm. broad. Like *V. chlorotica* with which the concatenate (sub-chroolepidea) gonidia also correspond." (*Nyl.*)

84. *V. pertenuis*, Leight. *cinereo-nigricant, thin, filmy, continuous, opake, furfuraceous*; *apothecia black, opake, minute*, numerous, *hemispherical, sessile*; *perithecium dimidiate*, black; epithecium a minute pore; paraphyses distinct, long, thickish; *spores* 8, *colourless, elongato-acicular, slender*, 3-septate.

On slaty rocks, rare. 1876.

SYN:—Leight. in Trans. Linn. Soc. 2nd. ser. 1. p. 239.
FIG:—Linn. Trans. l. c. t. 32. p. 20.
BOT. PROV:—6.
WALES:—Goodwick Bay! Pembrokeshire (Sept. 1876.)
Differing altogether from *V. chlorotica*, (Ach.) in the attenuated acicular spores and other characters as above. Gelatina hymenea I lutescent, especially asci & spores. Spores .034—035 mm. long .004 mm. broad. Spermogonia numerous, minute, verrucarioid, spermatia excessively minute, oblong or lineari-oblong, straight.

** *Perithecium entire.*

§ *Spores colourless.*

85. *V. incavata*, Nyl. *greyish-white*, thin, *tartareo-farinose*, con-

tiguous, smooth, sub-determinate; *apothecia* black, *deeply immersed in the thallus and rock beneath*, hemispherico-globose; *perithecium entire*; epithecium depressed with a large pore; paraphyses none; *spores* 8, colourless, *elliptico-oblong or oblong*, 3-*septate, constricted.*

On calcareous rocks, rare. 1859.

Resembling *V. immersa* in its habit and general external aspect.
SYN :—*Thelidium*, Mudd Man. 295. (1861.)
FIG :—Mudd Man. t. 5. f. 122.
EXS :—Mudd 282.
GEOG. DISTRIB ;—Europe.
BOT. PROV :—6...10, 11...26.
ENGLAND :—Ingleborough. *Dr. Carrington.* Bilsdale, Yorkshire; Castle Eden Dean, Durham. *Mr. Mudd.*
IRELAND :—Near Letterfrack. co. Galway. *Mr. Larbalestier.*
WALES :—Walls of Criccieth Castle!
"Spores .008 to .011 in. long, by .0035 to 0045 in. broad. t. 5. f. 122." *(Mudd.)* Spores .039—.053 mm. long. 014—.0215 mm. broad. Gelatina hymenea I red.

86. *V. marina*, (Deak.) *dark-greenish-black, sub-gelatinous, smooth*, continuous, effuse, nigro-limitate; *apothecia* black, *immersed in the thallus, excessively minute* and numerous; ostiolum slightly elevated; *epithecium large, impressed, umbilicate*; perithecium entire, black, thin; paraphyses none; *spores* 8, colourless, *lineari-oblong*, 1- or 3-septate, *very minute;* gelatina hymenea rubescent with iodine.

On submerged maritime rocks, rare. 1854.

SYN :—*Sagedia*, Deakin in Ann. and Mag. Nat. Hist. ser. 2. vol. 13. p. 40. (1854).
FIG :—Ann. and Mag. Nat. Hist. l. c. t. 4. f. 13.
GEOG. DISTRIB ;—Europe.
BOT. PROV :—1.
ENGLAND :—Meadfoot; near Torquay, Devon. *Dr. Deakin.* (1854.)
Spores .015 mm. long. . 004 mm. broad.

87. *V. dubiella*, Nyl. *cinerascent*, cartilaginous, granulato-unequal, sub-crenate ("an proprius"?); *apothecia black, small;* perithecium entire, black; paraphyses none; *spores* 8, colourless, *oblong or ovoideo-oblong*, 3-septate, *small*; gelatina hymenea vinous-red with iodine.

On mosses amongst mountains, probably parasitic, rare. 1864.

SYN :—Nyl in Flora 1865. p. 356. Carroll in Seem. Journ. Bot. 4. 25.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Loch-na-Cat, north Side of Ben Lawers. *Mr. Carroll.* (1864.)
"Spores . 016—21 mm. long, .005—7 mm. broad." *(Nyl.)*

88. *V. epigæoides*, Nyl. *pallido-virescent*, macular; *apothecia* black, *chiefly immersed;* perithecium black in the upper portion, fuscescent in the immersed part; paraphyses slender; *spores* 8, colourless, oblong, 3-*septate.*

On the earth in sub-alpine localities, rare. 1865.

SYN :—Nyl. in Flora 1867. p. 329. Carroll in Seem. Journ. Bot. 5. .259.
GEOG. DISTRIB :—Europe.
BOT. PROV :—24.
IRELAND :—Cliffs of Moher co. Clare. *Mr. Carroll.* (1865.

"Similar to *V. epigæa*, but smaller. Spores .018—27 mm. long, .005—8 mm. broad." (*Nyl.*)

89. *V. melathelia*, (Nyl.) thallus scarcely any, chroolepoid; *apothecia black, tuberculose*, prominent, *rugoso-irregular;* epithecium not always distinct; *perithecium* ellipsoid, nigricant or rufescent, *entire;* spores innumerable, ellipsoid or oblong, indistinctly 3-septate; paraphyses slender; filamenta ostiolaria slender; gelatina hymenea blue then dark-violet with iodine.

On mosses amongst alpine schistose rocks, rare. 1864.

SYN :—*Thelopsis*, Nyl. in Flora 1864. p. 258. Carroll in Seem. Journ. Bot. 3. 293.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Adm. Jones.* (1864); Craig Calliach, Breadalbane. *Rev. J. M. Crombie.*
"Spores .014—17 mm. long, .006—7 mm. broad." (*Nyl.*)

90. *V. sparsula*, Nyl. *dark-olivaceous or olivaceo-fuscous*, most minutely granulose; apothecia *black, sub-globulose, depressed;* perithecium entire, black; spores 8, colourless, ellipsoid, 3-septate; paraphyses none.

On chalk, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 291.
BOT. PROV :—3.
ENGLAND :—Dorking, Surrey. *Mr. Joshua.*
"Spores .023—27 mm. long, .010—13 mm. broad. Gelatina hymenea I vinous red." (*Nyl.*)

91. *V. humicolor*, Nyl. *castaneo-fuscescent*, or *castaneo-umbrine*, opake, very thin, continuous; *apothecia globose prominent, somewhat darker or umbrino-fuscous*, crowded; perithecium entire, in thin section luteo-fuscescent or with K aurantiaco-rufescent, internally white; spores 8, colourless, fusiform, 3-septate.

On peat-earth and on rocks among Jungermanniæ, rare. 1876.

SYN :—Nyl. in Flora 1877. p. 462.
BOT. PROV :—26.
IRELAND :—Mweelan! near Kylemore, Galway. *Mr. Larbalestier.* (1876.)
"Belonging to the stirps of *V. chlorotica*. Thallus has chroolepoid gonidia. Spores .024—33 mm. long, .004—5 mm. broad." (*Nyl.*) Spores .026 mm. long, .005 mm. broad.

§§ *Spores fuscous.*

92. *V. nitida*, (Weig.) *pale-yellow or olive or olive-brown, waxy, continuous, smooth*, more or less polished, with scattered whitish minute protuberances; *apothecia black, large, immersed* in, or invested by the thallus, hemispherico-globose; *ostiolum black*, more or less *denuded*; *perithecium entire*, black; epithecium large, depressed, umbilicate; paraphyses distinct; *spores* 8, *brown*, elliptical or oblong, slightly tapering towards each apex, 3-*septate, cells angulari-nucleolate;* gelatina hymenea untinged by iodine.

On trees, frequent. 1783.

SYN :—*Sphæria*, Weigel Obs. p. 45. (1772.) *Verrucaria*, Schrad. Journ. 1801. 1. p. 79. Ach. L. U. 279. Nyl. Pyren. 45. Scand. 279. Mudd Man. 298.

FIG :—E. Bot. Suppl. t. 2607. f. 1. Leight. Ang. Lich. t. 15. f. 3. Tul. Mem. t. 2. f. 6. 8.

EXS :—Schær. 111. Bohl. 106. Zw. 30. Leight. 27. Larbal. 48. Anzi Ital. S. 391. M. & N. 365. Welw. Lusit. 55.

GEOG. DISTRIB :—Switzerland, Germany, Italy, Portugal, Pyrenees, Sweden, Hungary, Himalaya, N. Zealand, Cuba.

BOT. PROV :—1, 2, 3, 4, 5...7, 8...10, 11...14, 15, 16...26...30, 31.

ENGLAND :—Oswestry ! Shropshire. *Rev. T. Salwey.* Gopsal ! Leicestershire. *Rev. A. Bloxam.* New Forest ! Hants. *Mr. Lyell.* Epping Forest. *Rev. J. M. Crombie.* Torquay ! Devon. *Dr. Deakin.* Helks Wood, Ingleborough. *Dr. Carrington.* Clifton near Bristol. *Miss Attwood.* Castle Eden Deane, Durham ; Bilsdale, Yorkshire ; Kildale, Cleveland. *Mr. Mudd.* Budleigh Salterton, Devon. *Dr. Dickie.* Kelvedon, Essex. *Mr. Varenne.* Midland Counties. *Mr. Purton.* Pophills, Warwickshire. *Rev. W. S. Rufford.* Oxford. *Mr. Baxter.* Cambridgeshire. *Rev. R. Relhan.* Plymouth. *Mr. Holmes.* near Cirencester. *Mr. W. Joshua.*

SCOTLAND :—Auchindenny Wood. *Dr. Greville.* Lochaber ; Appin. *Rev. J. M. Crombie.*

IRELAND :—Redhall ! co. Antrim. *Mr. Thompson.* Ardglass co. Down. *Dr. Maingay.* Westport ! co. Mayo. *Mr. Larbalestier.*

WALES :—Near Harlech ! *Mr. T. Brittain.* Gloddaeth ! near Conway ; near Dolgelley ! Gwydir Woods ! Bettws-y-coed. Trefriw ! Llanbedrog ! Capel Arthog ! Glanartro ! Llanbedr.

CHANNEL ISLANDS :—Jersey ! Guernsey ; Sark. *Mr. Larbalestier.*

"Spores .005 to .007 in. long, by 002 to .0025 in. broad. t. 5. f. 124." (*Mudd.*) "Spores .022—25 mm. long, .007—8 mm. broad." (*Nyl.*) Spores .023—.027 mm. long, .010—.011 mm. broad.

forma *elæodes*, Leight. thallus *nigro-fuscous*, resembling an indeterminate, diffuse, dark-brown, oily stain.

On old laurel and other trees. 1872.

SYN :—Leight. in Grevillea 1. 60.

WALES :—Gwydir woods ! Bettws-y-coed. Eglwyseg Rocks !

Var. *nitidella*, Flk. pale-yellow, very thin ; apothecia one half the size of those of *nitida*.

On trees, frequent.

SYN :—Flk. D. L. 10. (1821.) Nyl. Pyr. 45. Scand. 279. Mudd Man. 299.

EXS —Zw. 30. B. 32. Welw. Lusit. 29. Leight. 28. Larbal. 99. Anzi Ital. S. 392. Hepp 958.

GEOG. DISTRIB :—Germany, Portugal, Italy, Switzerland, Belgium, Cuba, Ceylon.

BOT. PROV :—1...3 ..5...7...10...(19—30)...31.

ENGLAND :—Torquay ! Devon. *Dr. Deakin.* Kildale ! Cleveland. *Mr. Mudd.* Haddon, Exeter. *Mr. Parfitt.* near Lyndhurst, New Forest. *Rev. J. M. Crombie.* near Cirencester. *Mr. W. Joshua.* Hothfield Park, Kent. *Mr. Holmes.*

IRELAND :—On trees, frequent. *Mr. Carroll.*

WALES :—Gloddaeth ! near Conway.

CHANNEL ISLANDS :—Guernsey ; Sark ; Rozel, St. Peter's and St. Lawrence, Jersey ! *Mr. Larbalestier.*

Spores .023 mm. long, .009 mm. broad.

93. *V. glabrata*, Ach. *whitish, pale-yellow or greyish*, thin, *membranaceous*, opake ; *apothecia* black, moderate, *semi-immersed*, hemispherico-conoid ; *ostiolum denuded*; *perithecium entire*, black ; epithecium a minute pore ; paraphyses distinct ; *spores* 8, *fuscous*, ellipsoid, 3-septate or 4-*locular*, *smaller* than in *nitida* ; gelatina hymenea yellowish with iodine.

On smooth barks, rare.

SYN :—Ach. Syn. 91. (1867.) Nyl. Pyren. 47. Prod. 188.

FIG :—Hepp Sporen t. 25. f. 227.

EXS :—Schær. 110. M. & N. 950. Zw. 34.

GEOG. DISTRIB :—Switzerland, Germany, France, Italy, Hungary, N. America, New Zealand.

BOT. PROV :—7...19.
IRELAND :—Glengariff; Lough Inchiquin; Glencar co. Kerry; Killarney. *Mr. Carroll.*
WALES :—Capel Arthog!
Spores .021—.022 mm. long, .009 mm. broad.

Var. *dermatodes*, Borr. cream-coloured, very thin, determinate; apothecia half the size of those of *glabrata*.

On smooth barks, rare.

SYN :—Borr. in E. Bot. Suppl. 2607. (1829.) Tayl. Fl. Hib. 2. 87. Leight. Ang. Lich. 36. Mudd Man. 299. *V. glabratula*, Nyl. in Flora 1867. p. 330. *V. achroopora*, Nyl. in Flora 1867. p. 179.
FIG :—E. Bot. Suppl. t. 2607. f. 2. Leight. Ang. Lich. t. 15. f. 4.
GEOG. DISTRIB :—New Zealand.
BOT. PROV :—1...3...19.
ENGLAND :—Red Hills, Exeter. *Mr. Parfitt.* Rivenhall, Essex. *Mr. Varenne.*
IRELAND :—Near Bantry! *Miss Hutchins.* (1829.) near Killarney. *Sir T. Gage.* Askew Wood near Sneem. *Dr. Taylor.*
"Spores .003 to .00375 in. long, by .0015 to .00175 in. broad." (*Mudd.*) Spores .016—.018 mm. long, .007 mm. broad.

94. *V. peripherica*, (Tayl.) apothecia small, prominent, semi-immersed, conoid, black; perithecium entire; *spores* 8, fuscous, *constricted in the middle, formed of* 2 *short obtuse cones set base to base, each cell* septate.

On mountain rocks, rare. 1836.

SYN :—*Verrucaria*, Tayl. Fl. Hib. 2. 97. (1836.) Leight. Ang. Lich. 48. Mudd Man. 308.
FIG :—Leight. Ang. Lich. t. 21. f. 2.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...19.
IRELAND :—Carig Mountain! co. Kerry. *Dr. Taylor.* (1836.)
WALES :—Barmouth! *Rev. T. Salwey.* Trefriw falls!
"Spores .0035 to .004 in. long, by .00125 to .0015 in. broad." (*Mudd.*) Spores .017—.018 mm. long, .0065 mm. broad.

95. *V. dissepta*, Nyl. *albido-cinerascent, tartareous*, thin, sub-determinate, *rimuloso-areolate; apothecia black*, hemispherical, prominent, numerous; ostiolum denuded; epithecium a minute depressed pore; *perithecium entire*, black; paraphyses indistinct; *spores* 8, *fuscous or fusco-nigricant, ellipsoid*, 3-*septate*.

On micaceo-schistose rocks, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 576.
BOT. PROV :—26.
IRELAND :—Doughruagh Mountain! co. Galway. *Mr. Larbalestier.* (1876.)
"Spores .018—023 mm. long, .007—.010 mm. broad. I—." (*Nyl.*) Spores .024 mm. long, .01 mm. broad.

96. *V. leptaleella*, Nyl. "greenish, very thin, subleprose, somewhat similar to *V. leptalea*, (Mnt.) but with narrower spores .016—20 mm. long, .0025—.0030 mm. broad." (*Nyl.*) Perithecium entire; paraphyses thick, floccose; spores 8, fuscous, ellipsoid, 3-septate, .033 mm. long, .012 mm. broad, the two central cells nucleolate.

On bark of trees, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 237.
BOT. PROV :—26.
IRELAND :—Doughruagh, Connemara. *Mr. Larbalestier.* (1876.)

D. *Spores* 3-5-*septate.*

* *Perithecium dimidiate.*

97. *V. albissima*, (Ach.) *creamy-white*, very thin, membranous, effuse, smooth; *apothecia* black, elliptical, *hemispherico-conoid*, sessile; *perithecium dimidiate*, black; epithecium poriform; paraphyses indistinct; *spores* 8, colourless, *acicular*, more or less curved, 3 or 5-septate.

On birches, &c., rare. 1850.

SYN :—Nyl. Scand. 282. (1861.) *V. epidermidis var. albissima*, Ach. L. U. 276. (1810.) Syn. 89. *V. oxyspora*, Nyl. Pyr. 61. Mudd Man. 306.
EXS :—Nyl. 149. Mudd 299. Fellm. 223. Schær. 107. 108.
GEOG. DISTRIB :—Sweden, Austria, Hungary, France, Switzerland. E. Lapland.
BOT. PROV :—3...5...7...10...19...26.
ENGLAND :—Hoggarts Wood! Ingleby; Baysdale; and near Ayton; Cleveland. *Mr. Mudd.* Pod's Wood, Messing, Essex. *Mr. Varenne.* Alberbury! Shropshire. (1850).
SCOTLAND :—Castleton of Braemar. *Rev. J. M. Crombie.*
IRELAND :—Killarney; Little Island, Cork. *Mr. Carroll.* Kylemore Castle! *Mr. Larbalestier.*
WALES :—Dolgelley!
"Spores .005 to .006 in. long, by .0005 in. broad. t. 5. f. 127." *(Mudd.)* "Spores .020—34 mm. long, .003—4 mm. broad." *(Nyl.)* Spores .028 mm. long, .003 mm. broad.

98. *V. platypyrenia*, Nyl. effuse; *apothecia plane, at first hypophlœodal*, opake; paraphyses soft, irregular or indistinct; spores colourless or in age fuscescent, oblong, 3-5-septate.

On trees, rare. 1865.

SYN :—Nyl. in Flora 1865. p. 358. Carroll in Seem. Journ. Bot. 4. 25.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Ballyedmond co. Cork; Old Dromore, Kerry; Glenbower, Killeagh. *Mr. Carroll.* (1865.)
"Spores .023—30 mm. long, .009—.011 mm. broad." (*Nyl.*)

** *Perithecium entire.*

99. *V. furvescens*, Nyl. *fuscescent* or olivaceo-fuscescent, *granulato-unequal*, thin, opake, effuse, not continuous; *apothecia innate*, moderate, the *conical apex emersed*; *perithecium entire*, black; paraphyses slender, crowded; spores 8, colourless, fusiform, 3-5-septate.

On minute mosses on schistose earth in alpine localities, very rare. 1864.

SYN :—Nyl. in Flora 1864. p. 256. Carroll in Seem. Journ. Bot. 3. 293.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Adm. Jones.* (1864).
"Spores .031—33 mm. long. .006 mm. broad." (*Nyl.*)

100. *V. desistens*, Nyl. *evanescent*; *apothecia minute*; *perithecium entire*, upper portion *convex*, fusiform, prominent; paraphyses none; spores 8, colourless, fusiform, 3-5-septate, straight; gelatina hymenea vinous-red with iodine.

On old trees, very rare. 1867.

SYN :—Nyl. in Flora 1867. p. 180. Carroll in Seem. Journ. Bot. 5. 260.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Turk Mountain, Killarney. *Mr. Carroll.* (1867.)
"Spores .011—16 mm. long, .003—4 mm. broad." *(Nyl.)*

E. *Spores 5-septate.*

101. *V. perminuta*, Deak. *dark-olive-green*, thin, *continuous, uneven, rugose and warty*, indeterminate; *apothecia* brownish-black, *scattered or confluent, minute*, prominent, hemispherico-globose, *internally pale; perithecium dimidiate*, incurved at the base; inner tunic thin, black; epithecium a minute pore; *spores* 8, colourless, fusiform, 5-*septate*.

On maritime rocks, rare. 1854.

Closely allied to *V. chlorotica* var. *trachona*, Tayl.
SYN :—Deakin in Ann. and Mag. Nat. Hist. ser. 2. vol. 13. p. 32.
FIG :—Ann. and Mag. Nat. Hist. l. c. t. 2. f. 6.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1.
ENGLAND :—Torquay! Devon. *Dr. Deakin.* (1854.) Penzance, Cornwall. *Rev. T. Salwey.*

102. *V. horistica*, Leight. *rufous or rufo-ferruginous*, thin, subtartareous, smoothish, *with numerous dirty pale-whitish-yellow soredia, limited* by conspicuous *elevated thickish nigro-fuscous lines* resulting from the confluence of the hypothallus of many adjacent thalli; *apothecia nigro-fuscous or black*, scattered, few, hemispherical, depressed, umbilicate, sessile; perithecium nigro-fuscous, dimidiate; paraphyses distinct; spores 8, colourless, narrowly or attenuato-fusiform, 5-septate.

On shaded shaly mountain rocks, not common. 1871.

FIG :—Grevillea 1. t. 4. f. 1.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7.
WALES :—Wood opposite Tanybwlch Hotel, Capel Curig! Llyn Cwlyd! (1871.) Bettws-y-coed! Trefriw!
Spores .029 mm. long, .004 mm. broad.

F. *Spores 7-septate.*

* *Perithecium dimidiate.*

103. *V. lucens*, Tayl. *olivaceo-fuscescent or cinereo-fuscescent*, thin, tartareous, minutely rimulose or continuous, *nigro-limitate; apothecia black, prominent, shining*, conico-hemispherical, solitary or clustered, internally pale; *perithecium dimidiate*, black, thick, inner tunic pale-brown; epithecium depressed, umbilicate; paraphyses very slender, filiform, numerous; *spores* 8, colourless, broadly elongato-fusiform, 7-septate, *at least* 4 *times the size of those of V. chlorotica.*

On siliceous slate and basalt, rare. 1836.

SYN :—Tayl. Fl. Hib. 2. 257. (1836.) Leight. Ang. Lich. 55. Mudd Man. 299.
FIG :—Leight. Ang. Lich. t. 24. f. 2.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...19...26.
IRELAND :—Lough Finnehy; Blackwater Bridge! co. Kerry. *Dr. Taylor.* Croghane; Killarney. *Mr. Carroll.* Doughruagh! Galway. *Mr. Larbalestier.*

WALES :—(Spores 3-5-7-septate.) Trefriw falls ! Conway falls !
Spores .038—.045 mm. long, .0085—.010 mm. broad.

104. *V. lactea*, (Körb.) *cream-coloured*, thin, effuse ; *apothecia* black, minute, *sub-innato-sessile*, hemispherical ; *perithecium dimidiate*, incurved at the base, black ; epithecium poriform ; paraphyses distinct ; *spores* 8, colourless, *broadly lanceolato-fusiform*, 5-7-*septate* ; gelatina hymenea brownish or yellow with iodine.

On trees, very rare.

SYN :—*Sagedia lactea*, Körb. Syst. Lich. 366. (1855.)
EXS :—Zw. 44.
GEOG. DISTRIB :—Germany, Hungary, Switzerland.
BOT. PROV :—2.
ENGLAND :—Sussex ! *Herb. Hooker.*
Spores .0235—.0335 mm. long, .005—.007 mm. broad.

105. *V. olivacea*, Borr. *nigrescenti-olivaceo-virescent*, *sub-tartareous*, continuous or *rimose*, indeterminate ; *apothecia dull-black*, opake, rugose, *invested by the thallus*, hemispherico-globose, internally pale ; perithecium dimidiate, black ; epithecium a minute pore ; *spores* 8, colourless, *singularly elongato-clavato-fusiform*, 7-*septate*, large.

On trees, sycamore, ash, rare. 1829.

SYN :—Borr. in E. Bot. Suppl. 2597. (1829.) Leight. Ang. Lich. 42. Mudd Man. 301.
FIG :—E. Bot. Suppl. t. 2597. fig. 1. Leight. Ang. Lich. t. 18. f. 1.
EXS :—Leight. 199. Mudd 290.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2, 3...5, 6...8...10, 11...19...24...26, 27.
ENGLAND :—Sussex ! *Mr. Borrer.* (1829.) Gopsal ! Leicestershire. *Rev. A. Bloxam.* Airyholme ! Easby Wood ! Skutterskelf ! Ayton ! Cleveland. *Mr. Mudd.* New Forest. *Rev. J. M. Crombie.* Northumberland and Durham. *Mr. Winch.* Sibertswold and Penshurst, Kent. *Mr. Holmes.* Shere, Surrey. *Dr. Capron.* Haughmond Hill ! Alberbury ! Shropshire.
IRELAND :—Kerry. *Dr. Taylor.* Bantry. *Miss Hutchins.* Killaloe, co. Clare ! Loughcooter, Galway ; Muckruss, Killarney ; Tullagreen and Ballyedmond, Cork. *Mr. Carroll.* Lord Sligo's demesne, Westport ! co. Mayo. *Mr. Larbalestier.*
WALES :—River Gwaine ! Fishguard, Pembrokeshire.
"Spores .006 to .008 in. long, by .001 in. broad." *(Mudd.)* Spores .030—.040 mm. long, .004—.005 mm. broad.

106. *V. succina*, Leight. *thallus fuscescent*, thin, effuse, scarcely, if at all, surrounding the base of the apothecia ; *apothecia* numerous, large, *amber-colour*, *hemispherico-conical*, *papillate ; perithecium amber-colour throughout*, *dimidiate*, *spreading at the base ;* epithecium minute, poriform ; paraphyses very delicate and slender ; asci lineari-clavate ; *spores* 8, *colourless*, *broadly fusiform*, 7-*septate*, large.

On rocks, very rare. 1875.

SYN :—Leight. in Grevillea 4. p. 78. Linn. Trans. 2nd ser. 1. 145.
FIG :—Linn. Trans. l. c. t. 22. f. 8. 9. 10. 11. 12.
BOT. PROV :—26.
IRELAND :—Near the lake, Kylemore ! co. Galway. *Mr. Larbalestier.* (1875.)
The apothecia when wet become of a beautiful transparent amber-colour. Iodine has very slight, if any, reaction on the asci and spores. Its nearest ally would seem to be *V. illinita*, Nyl., but that species differs in having a whitish thallus, nigricant apothecia, the perithecium colourless in lower part and fuscous in the upper part, and iodine turning the asci and spores of a dirty deep-brown, and is also a corticolar lichen. Our lichen differs also in the size

and colour of the apothecia from *V. chlorotica*, (Ach.) which is associated on the same rock, and which has also smaller 3-septate fusiform spores. Spores .046 mm. long, .008 mm. broad. No spermogonia detected.

107. *V. insiliens*, Larbal. *dirty-pale-whity-brown, tartareous, thickish, subareolato-diffract*, areolæ plane, *subfurfuraceous*, (K—C—); *apothecia large, imbedded in rather large, hemispherical thalline tubercles*, which either entirely or partially cover the black papillate ostiolum; epithecium a minute pore; *perithecium dimidiate, nigro-fuscous*; inner tunic pale-brown; paraphyses slender, distinct; *spores* 8, *colourless, broadly fusiform, obtuse at the apices*, 5-7-*septate*; gelatina hymenea I colourless.

Damp recesses of caves, very rare. 1877.

SYN:—Nyl. in Flora 1877. p. 566.
BOT. PROV:—26.
IRELAND:—Twelve Pins! Galway. *Mr. Larbalestier.* (1877.)
"Spores .050—67 mm. long, .011—14 mm. broad. Gonidia chroolepoid." *(Nyl.)* Spores .057 mm. long, .011 mm. broad.

** *Perithecium entire.*

108. *V. leptospora*, Nyl. *fuscescent*, very thin or obsolete; *perithecium entire*, black; *spores* 8, colourless, *fusiform*, elongate, 7-*septate*.

On holly, very rare. 1864.

SYN:—Nyl. in Flora 1864. p. 487. Crombie En. 117.
GEOG. DISTRIB:—Portugal.
BOT. PROV:—19.
IRELAND:—Dinis Island, Killarney. *Mr. Carroll.* (1864.)
"Spores .0045—55 mm. long, .003—.004 mm. broad." (*Nyl.*)

109. *V. chlorococca*, Leight. *green, thickish, granulate*, somewhat areolato-diffract; *apothecia black, innate*, minute; *ostiolum black, convex or depressed*; epithecium poriform; *perithecium entire, black*; paraphyses none; *asci short, rotundate*; *spores* 8, *colourless, broadly cylindrico-fusiform, obtuse at the apices*, 7-*septate*.

On ash, rare. 1878.

BOT. PROV:—3.
ENGLAND:—Near Stokenchurch! highest point of Chiltern Hills, Buckinghamshire. *Mr. Larbalestier.*
Spores .031—.034 mm. long, .009 mm. broad.

G. *Spores murali-locular.*

* *Perithecium dimidiate.*

§ *Spores fuscous.*

110. *V. umbrina*, Whlnb. *fuscescent or fuscous-black*, thin, opake, smoothish or granuloso-unequal, *rimulose or sub-areolato-rimulose*, diffuse; *apothecia innate in prominent mastoid thalline tubercles*; *perithecium dimidiate*, black; inner tunic pale-brown; paraphyses none; *spores* 2, dull-green or fuscous, lineari-oblong, rounded at each extremity, murali-locular, large.

On rocks in rivers and sub-alpine lakes, not common.

SYN :—Whlnb. Fl. Suec. 871. pr. p. (1824.) Nyl. Scand. 269. *Endocarpon lithinum* and *fissum*, Leight. Ang. 19. & 20. *Verrucaria fissa*, Tayl. Fl. Hib. 2. 95.

FIG :—Leight. Ang. Lich. t. 6. f. 1. 2. 3.

EXS :—Leight. 98. Zw. 105. 27. bis. Hepp 103. Anzi Langob. 234.

GEOG. DISTRIB :—Germany, Italy, Hungary, Europe, Pyrenees, Scandinavia, Himalaya, N. America.

BOT. PROV :—7...11...15...19...30.

ENGLAND :—High Force, Teesdale ! Durham. *Rev. J. Harriman.*

SCOTLAND :—Ben Lawers. *Adm. Jones.* Ben-y-gloe ; Craig Tulloch, *Rev. J. M. Crombie.*

IRELAND :—Near Ardglass, co. Down. *Dr .Maingay.* Carig ! Kerry. *Dr. Taylor.* Sunday's Well Weirs, Cork. *Mr. Carroll.*

WALES :—Rocky bed of river Dee at Llangollen ! Denbighshire. Trefriw falls !

"Spores .045—55 mm. long, .018—22 mm. broad." (*Nyl.*) Spores .033—.048 mm. long, .014—.018 mm. broad.

111. *V. clopima*, Whlnb. *olivaceo-fuscescent, tartareous, thickish, verrucoso-areolate, areolæ tumid*, diffuse ; *apothecia immersed* in the thalline verrucæ ; perithecium dimidiate, black ; epithecium umbilicato-depressed ; paraphyses none ; *spores* 2, *fuscous*, lineari-oblong, murali-locular, large.

On rocks in rivers, not common. 1875.

SYN :—Whlnb. Suppl. 19. (1803.) Nyl. Scand. 269.

FIG :—Hepp Sporen t. 12. f. 101.

EXS :—Zw. 313. 27. Hepp 101. Anzi It. S. 397. Rabh. 938. Fries 415. fide Nyl.

GEOG. DISTRIB :—Germany, Italy, Switzerland, Sweden.

BOT. PROV :—26.

IRELAND :—Dawros river ! Galway. *Mr. Larbalestier.* (1875.)

"Spores .032—48 mm. long, .012—23 mm. broad." (*Nyl.*) Spores .041—.053 mm. long, .018—.021 mm. broad. Gelatina hymenea I reddish-blue.

112. *V. subumbrina*, Nyl. *pale-dusky-brown*, thin, *subfurfuraceous*, effuse ; *apothecia* scattered, *surrounded at the base by the encircling thallus* ; *ostiolum black, convex* ; epithecium a conspicuous pore ; *perithecium dimidiate, black*, inner tunic pale-brownish ; *paraphyses none*, filamenta ostiolaria slender ; *spores* 6, *fuscous, broadly-oblong, muralilocular*, very large ; gelatina hymenea I vinous-red.

On stones in mountain torrents, very rare. 1864.

SYN :—Nyl. Scand. 269.

GEOG. DISTRIB :—Norway.

BOT. PROV :—15 ..22...26.

SCOTLAND :—Ben Lawers. *Adm. Jones.* (1864.) Gorchlochan, shores of Perth or Inverness. *Mr. Larbalestier.*

IRELAND :—Near Kylemore co. Galway ! *Mr. Larbalestier.* Tonlagee, co. Wicklow. *Mr. Archer.*

"Spores .046—55 mm. long, .023—24 mm. broad." (*Nyl.*) Spores .052 mm. long, .029 mm. broad. This approaches *V. hymenea*, Wallr. (Anzi Catal. p. 111. Anzi Langob. 243 !) in general characters, size and colour of the spores, but differs in the number of the spores.

113. *V. scotinospora*, Nyl. *whitish*, scarcely any, or *evanescent ; apothecia large*, prominent, sessile, *convexo-conical*, black ; *epithecium large, conspicuous, umbilicato-depressed ; perithecium dimidiate*, very thick, *nearly entire*, inner tunic black ; paraphyses none ; *spores* 8, *fuscous*, oblong, *murali-locular, cells irregular*, moderate ; gelatina hymenea vinous-red with iodine.

On alpine micaceo-schistose rocks, very rare. 1860.

SYN :—Nyl. Scand. 270. (1861.) Mudd Man. 282.
GEOG. DISTRIB :—Europe.
BOT. PROV :—7...15...26.
SCOTLAND :—Ben Lawers ! Head of Loch-na-Cat. *Adm. Jones.* (1860.) Summit of Craig-na-Calliach. *Dr. Maingay.*
IRELAND :—Kylemore Castle ! co. Galway. *Mr. Larbalestier.*
WALES :—Snowdon. *Mr. Holmes.* Cwm Cywion, ! Glyder fach ! Crib Coch ! Snowdon.
"Spores .030—34 mm. long, .013—16 mm. broad." *(Nyl.)* "Spores .026—40 mm. long, .013—21 mm. broad." *(T. M. Fr.)* "Spores .007 to .008 in. long, by .004 to .0045 in. broad." *(Mudd.)* Spores .035 mm. long, .020 mm. broad.

114. *V. isidioides*, Borr. *yellowish-brown*, crustaceous, rimoso-areolate, *areolæ verrucose*, convex, *protuberant*, crowded and difformed, smooth, opake; *apothecia* dark-brown, *immersed in the depressed apex of the thallodal verrucæ;* ostiolum plano-convex, denuded, dark-brown; epithecium a simple pore; *perithecium* dimidiate, dark-brown, inner tunic pale-brown; paraphyses conglutinate; spores 8, colourless, lineari-oblong, tapering towards each obtuse apex, 7-septate when young, ultimately fuscous and murali-locular, large; gelatina hymenea untinged with iodine.

On subalpine rocks, very rare. 1830.

SYN :—Borr. ! in E. Bot. Suppl. t. 2622. (1830.) Leight. Ang. Lich. 20. Mudd Man. 270.
FIG :—E. Bot. Suppl. t. 2622. f. 1. Leight. Ang. Lich. t. 6. f. 4.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Glengariff ! near Bantry. *Miss Hutchins.* (1830.)
"Spores .007 to .009 in. long, by .003 to .004 in broad." *(Mudd.)* Spores .046 mm. long, .016 mm. broad.

115. *V. subpyrenophora*, Leight. *tawny-cinereous*, crustaceous, thin, *rimulose*, *minutely granulato-areolate*, (K—C—); *apothecia large* and conspicuous, black, *conical* or conico-hemispherical, the *base only enveloped by the thallus*, papillate or with a small pore; perithecium dimidiate, black; *paraphyses very slender, distinct;* spores 8, at first colourless, ultimately fuscous, elliptico-oblong, murali-locular, large.

On subalpine rocks, rare. 1871.

GEOG. DISTRIB :—Europe.
BOT. PROV :—7.
SCOTLAND :—Ben Lawers. *Dr. Holl.*
IRELAND :—Kylemore Castle ! co. Galway. *Mr. Larbalestier.*
WALES :—Snowdon ! *Mr. Holmes.* Cwm Cywion, ! Glyder fach. (1871.)
Somewhat externally like *V. verrucoso-areolata*, but distinct in having paraphyses and in the spores being two-thirds less in size. Spores .066 mm. long, .033 mm. broad. "Spores .048—57 mm. long, .028—39 mm. broad." (*T. M. Fr.*)

116. *V. peltophora*, Strn. *squamulose*, *squamulæ green*, thin, smooth, approximate or scattered, *recurved at the margins*; *apothecia black*, large, prominent; *perithecium dimidiate*; spores 8, fuscous, ellipsoid, muraliform, rather large; paraphyses few, slender, *interspersed with oily globules;* filamenta ostiolaria numerous; gelatina hymenea I vinous-red.

On the earth. 1874.

SYN :—Stirton in Grevillea 3. p. 37. (1874.)
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Dr. Stirton.* (1874.)
"Spores .045—.038 mm. long, .02—.03 mm. broad." (*Stirt.*)

§§ *Spores colourless.*

117. *V. intercedens*, Nyl. *cinerascent or cinereo-fuscescent*, tartareous, thin, *contiguous or rimulose; apothecia large, convexo-conical*, prominent, basally immersed, black; *epithecium large, conspicuous, umbilicato-depressed; perithecium dimidiate;* paraphyses none; *spores* 8, *colourless*, elliptical, *murali-locular, cells* irregular, moderate; gelatina hymenea vinous-red with iodine.

On alpine schistose rocks, rare. 1864.

SYN :—Nyl. Pyren. 33. (1858.) Scand. 276. Carroll in Seem. Journ. Bot. 3. 292.
FIG :—Hepp Sporen t. 51. f. 445. central spore.
EXS :—"Hepp 445." Arn. 146.
GEOG. DISTRIB :—Sweden, Switzerland, Pyrenees, Germany.
BOT. PROV :—2...15.
ENGLAND :—Downs, Sussex. *Mr. Larbalestier.*
SCOTLAND :—Ben Lawers. *Messrs. Jones & Carroll.* (1864.)
"Spores .024—42 mm. long, .015—21 mm. broad." (*T. M. Fr.*) "Spores .018–23 mm. long, .011—13 mm. broad." *(Nyl.)* Spores .034 mm. long, .016—.017 mm. broad.

118. *V. fusco-argillacea*, (Anzi.) *fusco-cinerascent or albido-cinerascent*, thin, effuse, minutely rimulose or verrucoso-subareolate, unequal, at length farinaceous; *apothecia* black, moderate, *numerous and crowded*, sessile, innate at the base, hemispherical; *perithecium dimidiate*, thickish, black, inner tunic very thin, black; epithecium poriform, depressed or umbilicate; paraphyses none; *spores* 8, colourless, *rotundato ellipsoid, murali-locular, rather small;* gelatina hymenea reddish with iodine.

On calcareous rocks, rare. 1870.

SYN :—*Polyblastia*, Anzi Symbola 26. (1864.)
EXS :—Anzi Langob. 368.
GEOG. DISTRIB :—Italy, Scandinavia.
BOT. PROV :—5...15...26.
ENGLAND :—Hyde, Gloucestershire. *Mr. W. Joshua.*
SCOTLAND :—Craig Tulloch, ! and at base of Ben-y-gloe, Blair Athole. *Rev. J. M. Crombie.* (1870.)
IRELAND :—Doughruagh Mountain ! co. Galway. *Mr. Larbalestier.*
"Spores .018—28 mm. long, .011—16 mm. broad." (*T. M. Fr.*) Spores .026—.029 mm. long, .015—.018 mm. broad.

119. *V. Carrollii*, (Mudd.) *greyish-white or cream-colour*, thin, determinate, membranaceo-cartilaginous, smooth, contiguous, or slightly rimulose; *apothecia minute, innate* in elevated thalline protuberances, solitary, hemispherico-subdepressed; *ostiolum somewhat rugulose*, rounded or slightly depressed; epithecium obsolete; *perithecium dimidiate*, brownish-black, inner tunic pale; *paraphyses distinct, capillary, flexuose; spores* 6-8, pale-yellow, elliptico-oblong or obovate, irregularly murali-locular, very variable in size.

On young ash trees, and sandstone, very rare. 1861.

SYN :—*Sphæromphale*, Mudd Man. 283 (1861.)
FIG :—Mudd Man. t. 5. f. 115.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19...24...28.
IRELAND :—Rostellan, Cork Harbour; and Castleconnel, Limerick; Ballaghbeama Gap, Kerry; Dinis, Killarney. *Mr. Carroll.* (1861.) Armagh Demesne. *Adm Jones.*
"Spores .0035 to .007 in. long, by .0015 to .003 in broad." *(Mudd.)*

[illegible]

[illegible] black, [illegible] fuscescent [illegible]

[illegible] Mudd Man. [illegible] *Ver. umbrina var. calcarea*, [illegible]
[illegible]
[illegible]
[illegible] *Mr. Baker.*
[illegible] Braemar. *Adm. Jones.*
[illegible] Antrim. *Adm. Jones.* Ballynakill Bridge! Galway. *Mr. Larbalestier*
"Spores .008 to .012 in. long, by .004 to .005 broad." (*Mudd.*)

123\. *V. rupifraga*, (Mass.) *darkly-cinereo-albescent, tartareo-farinose*, pulverulent, effuse; *apothecia black, entirely immersed in the rock*, spherical; *perithecium entire*, black; ostiolum plane or plano-convex; epithecium a minute pore; paraphyses none; spores 4 (6—8 Mass.) fuscous, ovoid or ellipsoid, murali-locular, large; gelatina hymenea vinous with iodine.

On calcareous rocks, rare. 1869.

Syn.: Mass. Hymen. p. 100. (1855.) Crombie En. 102.
Exs.: Arn. 199.

GEOG. DISTRIB :—Italy, Bavaria.
BOT. PROV :—15.
SCOTLAND :—Craig Guie, Grampians. *Rev. J. M. Crombie.* (1869.)
Spores .050 mm. long, .021 mm. broad.

124. *V. nigrata*, Nyl. *fuscous-black*, thin, areolato-unequal, *sub-granulose*, effuse; *apothecia black, immersed, small*; ostiolum black, somewhat prominent, plano-convex; *epithecium impressed; perithecium entire*; paraphyses distinct, short, dissolving; *spores* 8, *fuscous*, ellipsoid, irregularly murali-locular, *small;* gelatina hymenea dull-blue-green, then vinous-red-yellow with iodine.

On mossy earth in alpine places, very rare. (1860.)

SYN :—Nyl. Prodr. 184. (1857.) *Sphæromphale*, Mudd Man. 283.
GEOG. DISTRIB :—Pyrenees.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Adm. Jones.* (1860.)
"Spores .008 to .011 in. long, by .0035 to .005 in. broad. (*Mudd.*) "Spores .029—.049 mm. long, .020—.027 mm. broad." (*Nyl.*) Spores .033 mm. long, .016 mm. broad.

125. *V. Henscheliana*, (Körb.) *cinereo-fuscous or nigro-fuscous*, effuse, *thin*, tartareous, *unequal*; *apothecia black, large, sub-globoso-tuberculiform, somewhat conical*, sessile; *epithecium papillate with a simple conspicuous pore; perithecium entire*, nigro-fuscous; paraphyses slender, diffluent; filamenta ostiolaria distinct; *spores* 8, large, oblongo-ellipsoid, irregularly murali-locular, at first colourless or fuscescent, ultimately fuscous; gelatina hymenea pale-vinous with iodine.

On micaceo-schistose alpine rocks, not unfrequent. 1869.

SYN :—*Sphæromphale*, Körb. S. L. G. 336. (1855.) *Sporodictyon*, Körb. Parerg. 332.
GEOG. DISTRIB :—Germany, Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Ben Voirloch! *Dr. Stirton.* (1869.) Craig Tulloch! Blair Athole. *Rev. J. M. Crombie.*
"Spores .046—56 mm. long, .023—33 mm. broad." (*T. M. Fr.*) Spores .061 mm. long, .029 mm. broad.

126. *V. theleodes*, Smrft. *creamy-white*, thick, tartareous, *ruguloso-areolate, with large*, scattered, rugose, *prominent verrucæ; apothecia* very large, *inclosed in the thalline verrucæ; ostiolum black*, more or less *denuded*, depresso-convex; epithecium perforate, simple; *perithecium entire*, black, very thick; paraphyses none; filamenta ostiolaria very large and distinct; spores 8, dark-brown, broadly-ellipsoid, murali-locular, very large; gelatina hymenea vinous-red with iodine.

On micaceo-schistose alpine rocks, rare. 1860.

SYN :—Smrft. Lapp. 140. (1826.) Schær. Enum. 215. Carroll in Seem. Journ. Bot. 3. 292.
GEOG. DISTRIB :—Norway.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Adm. Jones.* (1860.) Craig Guie. *Rev. J. M. Crombie.*
"Spores .060—84 mm. long, .024—45 mm. broad." (*T. M. Fr.*)

forma *verrucoso-areolata*, (Schær.) similar to the type, but with a *dimidiate perithecium* and spores so dark in an old state as to make the muriform divisions almost invisible.

On micaceo-schistose alpine rocks, rare. 1860.

SYN :—*Lecanora atra var. verrucoso-areolata*, Schær. Enum. 37. (150) *Verrucaria*, Nyl. Pyren. 34. Scand. 270. *Sphæromphale*, Mudd Man. 282. Carroll in Seem. Journ. Bot. 3. 292.
FIG :—Mudd Man. t. 5. f. 119.
EXS :—Schær. 538. Anzi Langob. 236.
GEOG. DISTRIB :—Switzerland, Hungary.
BOT. PROV :—7...15...26.
SCOTLAND :—Ben Lawers ! *Adm. Jones.* (1860.)
IRELAND :—Doughruagh Mountain ! co. Galway. *Mr. Larbalestier.*
WALES :—Cwm Clyd !
"Spores .015 to .017 in. long, by .008 to .009 in. broad. t. 5. f. 119." (*Mudd.*) "Spores .064—82 mm. long, .038—45 mm. broad." (*Nyl.*) Spores .080 mm. long, .041 mm. broad.
A forma *inundata*, Nyl. in Cromb. L. Brit. p. 110, with an obsolete crust, occurs on sandstone rocks, rare, at Ballaghbeama Gap, Kerry. *Mr. Carroll.* and in a stream at Cromaglown, Killarney. *Adm. Jones.*

127. *V. gothica*, (T. M. Fr.) evanescent ; *apothecia* black, moderate, scattered, *hemispherico-conoid*, sessile, *prominent ; perithecium entire*, black ; *paraphyses indistinct* ; spores 8, fuscous, elliptico-oblong, 5-septate, murali-locular ; gelatina hymenea vinous-red with iodine.

On larch poles, rare. 1861.

SYN :—*Polyblastia*, T. M. Fr. Bot. Nat. 1865. p. 112. Spitz. p. 48. Polybl. Scand. 26. *Verrucaria pituphloia*, Leight. L. Fl. ed. 2. p. 458.
GEOG. DISTRIB :—Europe.
BOT. PROV :—5.
ENGLAND :—Shrewsbury, Shropshire. (1861.)
"Spores .018—28 mm. long, .007—9 mm. broad." (*T. M. Fr.*) Spores .025—.026 mm. long, .008—.010 mm. broad.

128. *V. pyrenuloides*, (Mnt.) *var. Hibernica*, Nyl. similar to *V. nitida*, but with aggregate apothecia and multilocular fuscous spores 4-8, cells in 12 or more plurilocular series ; gelatina hymenea and asci slightly vinous-red with iodine.

On hazel, very rare. 1867.

SYN :—Nyl. in Flora 1868. p. 163. Crombie En. 118.
GEOG. DISTRIB :—Europe.
BOT. PROV :—19.
IRELAND :—Turk Mountain and Eagle's Nest, Killarney. *Mr. Carroll.* (1867.)
"Spores .070—.110 mm. long, .025—.038 mm. broad." (*Nyl.*)

129. *V. Sendtneri*, (Kphbr.) *albido-cinereous*, cartilaginous, *incrusting*, contiguous, *squamuloso-effigurate*, smooth and unequal ; *apothecia* black, *minute*, *globose*, *immersed*, then emergent ; epithecium umbilicate ; *perithecium* black, *entire* ; spores 8, pallido-fuscescent, ovoid, murali-locular ; paraphyses none ; gelatina hymenea vinous-red with iodine.

On mossy earth in alpine regions, rare. 1865.

SYN :—*Polyblastia*, Kphbr. in Flora 1855. p. 67. *Verrucaria*, Nyl. Pyren. 33. Carroll in Seem. Journ. Bot. 3. 292.
FIG :—Hepp Sporen t. 51. f. 447.
EXS :—Hepp 447. Arn. 130. Anzi Langob. 220.
GEOG. DISTRIB :—Switzerland, Bavaria, Italy, Scandinavia.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Messrs. Jones & Carroll.* (1865.)
"Spores .015—30 mm. long, .009—14 mm. broad." (*T. M. Fr.*) "Spores .027—32 mm. long, .012—13 mm. broad." (*Nyl.*) Spores .028 mm. long, .013 mm. broad.

130. *V. pallida*, (Ach.) *pallido-rufescent* or fuscescent, *squamulose*, squamæ imbricate, flexuose, lobate, sub-crenate; *apothecia* minute, *immersed; ostiolum protruded*, prominent, *brownish-black;* epithecium a simple pore; *perithecium entire*, dark-brown; spores 2, pale-yellow, lineari-oblong, 1-septate, murali-locular, large.

On earth-covered rocks, very rare. 1813.

SYN :—*Endocarpon*, Ach. L. U. 301. (1810.) Syn. 100. Leight. Ang. Lich. 19. *Verrucaria*, Nyl. Prodr. 178. Pyren. 20. Scand. 268. Mudd Man. 269.
FIG :—E. Bot. t. 2541. Leight Ang. Lich. t. 5. f. 3.
GEOG. DISTRIB :—Europe, Sweden, Algeria, N. America.
BOT. PROV :—19.
IRELAND :—Southern portion! *Sir T. Gage.* (1813.)
"Spores .008 to .009 in. long, by .0025 to .003 in. broad." (*Mudd.*) "Spores .034—50 mm. long, .014—19 mm. broad." (*Nyl.*) Spores .054 mm. long, .016 mm. broad.

131. *V. Garovaglii*, Mnt. *fuscescent, crustaceo-concrescent, squamulose, squamules* small, *closely adnate, slightly elevated, lobed and crenate at the circumference; apothecia* minute, *immersed;* ostiolum prominent, naked, black; epithecium a simple pore; perithecium entire, black; paraphyses none; filamenta ostiolaria minute, slender, crowded; spores 2, green or pale-yellowish-brown, lineari-oblong, 1-septate, murali-locular, large.

On earth-covered maritime rocks, very rare. 1809.

SYN :—Mnt. in Ann. Sc. Nat. ser. 3. vol. 11. p. 59. (1849.) Nyl. Pyren. 20. *V. sorediata*, Borr. in E. Bot. Suppl. 2612. Leight. Ang. Lich. 18.
FIG :—E. Bot. Suppl. t. 2612. f. 2. Leight. Ang. Lich. t. 5. f. 2.
EXS :—Nyl. 90. Hepp 100. Zw. 210. Arn. 99. Th. M. Fr. 22.
GEOG. DISTRIB :—France, Switzerland, Germany, Bavaria, Sweden, Hungary.
BOT. PROV :—2...4.
ENGLAND :—Thetford. *Mr. Turner.* (1809.) Rottingdean Cliffs! Sussex. *Mr. Borrer.*
"Spores .008 to .011 in. long, by .00275 to .0035 in. broad. t. 5. f. 111." (*Mudd.*) Spores .049—.050 mm. long, .018—.019 mm. broad.

132. *V. diminuta*, Arn. *cinereo-albescent*, thin, tartareous; *apothecia black, entirely immersed*, very minute; ostiolum slightly prominent; epithecium minutely poriform; *perithecium entire, globose;* paraphyses none; spores 8, colourless, then fuscous, ellipsoid, or broadly oblong, murali-locular.

On moist rocks, rare. 1876.

SYN :—Arn. in Flora 1861. p. 264. Kplhbr. Lich. Bay. 294.
EXS :—Arn. 200. & 200. b.
GEOG. DISTRIB :—Germany.
BOT. PROV :—26.
IRELAND :—Recess Road! Connemara. *Mr. Larbalestier.* (1876.)
"Spores .022—26 mm. long, .012 mm. broad." (*Kplhbr.*) Spores .0245—.030 mm. long, .013—.015 mm. broad.

§§ *Spores colourless.*

133. *V. hymenogonia*, Nyl. *whitish or pale-grey*, very thin, *leproso-tartareous* or evanescent; apothecia moderate, prominent, *semi-immersed, convex; perithecium entire*, black; paraphyses none; spores 8, colourless, lineari-oblong, murali-locular, often 1-septate; gonidia hymenea oblong, green; gelatina hymenea vinous-red with iodine.

On mortar and calcareous rocks, not common. 1830.

SYN :—Nyl. Prodr. 184. (1857.) Pyren. 32. Mudd Man. 282. *Verr. muralis*, Leight. Ang. Lich. 46.
FIG :—E. Bot. Suppl. t. 2647. f. 2. Leight. Ang. Lich. t. 20. f. 1.
GEOG. DISTRIB :—France, Belgium, Italy.
BOT. PROV :—1, 2, 3...5...7...15...19.
ENGLAND :—Sussex ! *Mr. Borrer.* (1830.) Exeter. *Mr. Parfitt.* Messing, Kelvedon ; Mistley, Essex. *Mr. Varenne.* Wenlock ! Shropshire.
SCOTLAND :—Morrone. *Adm. Jones.* Craig Guie, Braemar. *Rev. J. M. Crombie.*
IRELAND :—Glanmuir ! near Riverstown, Cork. *Mr. Carroll.*
WALES :—Bridge below Llyn Bodlyn ! Merionethshire. *Rev. T. Salwey.* Aberdovey ! *Rev. A. Bloxam.*
"Spores .005 to .007 in. long, by .002 to .0035 in. broad." *(Mudd.)* "Spores .018—34 mm. long, .011—17 mm. broad." (*Nyl.*) Spores .03—.033 mm. long, .011 mm. broad.

134. *V. inumbrata*, Nyl. *fuscescent* or darkly-cinereo-fuscescent or dark-tawny, thin, effuse, unequal, often dispersed ; *apothecia* moderate, *covered with the thallus ; ostiolum naked* ; epithecium most minute, generally impressed ; *perithecium entire*, black ; *spores* 8, colourless, oblongo-ellipsoid or ellipsoid, *murali-divided* ; gelatina hymenea vinous-red with iodine.

On alpine micaceo-schistose rocks, very rare. 1864.

SYN :—Nyl. in Flora 1864. p. 255. Carroll in Seem. Journ. Bot. 3. 292.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Ben Lawers. *Adm. Jones.* (1864.)
"Spores .033—50 mm. long, .017—25 mm. broad." *(Nyl.)*

135. *V. subinumbrata*, Nyl. *cinerascent*, very thin or sub-evanescent ; *apothecia in fuscescent, thalline verruculæ ;* similar to V. inumbrata, Nyl. in Flora 1864. p. 355, but differs (perhaps only as a subspecies) in the smaller spores .022—30 mm. long, .015—18 mm. broad.

On micaceo-schistose rocks, rare. 1877.

SYN :—Nyl. in Flora. 1878. p. 246.
BOT. PROV :—26.
IRELAND :—Kylemore. *Mr. Larbalestier.* (1877.)

136. *V. modesta*, Nyl. *whitish*, thin, continuous or rimose, *unequal, with small protuberances, in which are included the apothecia ;* perithecium colourless, fuscescent upwards , *ostiolum a fuscous point* ; spores 8, colourless, ellipsoid, murali-divided.

On trees, poplar, birch, &c., rare. 1876.

SYN :—Nyl. Coll. Gall. mer. Pyr. 16. (1853) ; Pyren. 63.
EXS :—Nyl. Par. 97.
GEOG. DISTRIB :—France.
BOT. PROV :—5.
ENGLAND :—Barnsley Park ! Gloucestershire. *Mr. Joshua.* (1876.)
"Spores .019—38 mm. long, .011—18 mm. broad." (*Nyl.*)

H. *Parasitic species.*

* *Perithecium dimidiate.*

§ *Spores colourless.*

137. *V. allogena*, Nyl. *apothecia black*, at length prominent ; *perithecium black, dimidiate, the immersed or lower portion nearly*

*colourless or slightly fuscescent*; *paraphyses distinct*; spores 8, colourless, oblong, 1-septate, in form and size like those of *V. epidermidis*.

Parasitic on thallus of *Lecidea excentrica*, on micaceo-schistose alpine rocks, very rare. 1864.

SYN:—Nyl. in Flora 1865. p. 357. Carroll in Seem. Journ. Bot. vol. 4. p. 25.
GEOG. DISTRIB:—Europe.
BOT. PROV:—15...26.
SCOTLAND:—Near summit of Ben Lawers. *Mr. Carroll.* (1864.)
IRELAND:—Near Kylemore Castle! co. Galway. *Mr. Larbalestier.*
"Spores .0023—27 mm. long, .008—9 mm. broad." (*Nyl.*)

138. *V. endococcoidea*, Nyl. *apothecia* black, minute, *endococcoid*; *immersed portion* of the perithecium thin and *fuscous*, upper visible portion somewhat convex; paraphyses none; *spores* 8, colourless, oblongo-ellipsoid, 3-*septate*, pale-blue with iodine; gelatina hymenea vinous-red with iodine.

Parasitic on thallus of *Lecidea excentrica*, (Ach.) in alpine localities, very rare. 1865.

SYN:—Nyl. in Flora 1865. p. 356. Carroll in Seem. Journ. Bot. 4. 25.
GEOG. DISTRIB:—Europe.
BOT. PROV:—15.
SCOTLAND:—Near summit of Ben Lawers. *Mr. Carroll.* (1865.)
"Spores .016—18 mm. long, .006—7 mm. broad." (*Nyl.*)

§§ *Spores fuscous.*

139. *V. microstictica*, (Leight.) *apothecia black*, very minute, *immersed* or semi-immersed; ostiolum black, plano-convex; epithecium a minute pore; *perithecium dimidiate, brown*; paraphyses distinct, flocculose, branched, entangled; *spores* 8, *fuscous*, oblong, 1-septate, minute.

Parasitic on thallus of *Lecanora cervina*, rare. 1856.

Possibly only a *fungillus*.
SYN:—*Endocarpon*, Leight. Exs. 317. (1858.)
EXS:—Leight. Exs. 317.
GEOG. DISTRIB:—Europe.
BOT. PROV:—7.
WALES:—Borthwen! Barmouth. (1856.)

140. *V. hetairizans*, Leight. *apothecia black, minute, immersed*; *perithecium* black, *dimidiate*; *ostiolum minute, denuded, black*; epithecium minute, impressed; paraphyses indistinct; *spores* 8, *fuscous, linear*, rounded at each extremity, 3-*septate, constricted*.

Parasitic on thallus of *Verrucaria submersa*, Borr. E. Bot. Suppl. 2768, rare. 1851.

SYN:—*V. margacea*, Leight. Ang. Lich. p. 62. excl. syn. (1851.)
FIG:—Leight. Ang. Lich. t. 26. fig. 3. E.
GEOG. DISTRIB:—Europe.
BOT. PROV:—2.
ENGLAND:—Sussex! *Mr. Borrer.*
In my Ang. Lich. I must have taken this for the mature state of the spores of *V. submersa*, which are as represented in E. Bot. Suppl. l. c. Recent re-examination shews me that there are two lichens consociated on the same thallus. Possibly the present one may be only a *fungillus*. Spores .019—.025 mm. long, .006—.008 mm. broad.

141. *V. fumosaria*, Leight. *apothecia black*, minute, *hemi-*

*spherico-depressed, semi-immersed;* epithecium poriform; *perithecium dimidiate, much incurved at the base*; paraphyses none; *spores* 8, *fuscous, oblong*, 1-*septate*.

Parasitic on the thallus of *Lecidea fuscoatra f. fumosa*, Ach., rare. 1876.

SYN :—Leight. in Linn. Trans. 2d. ser. 1. 239.
FIG :—Linn. Trans. l. c. t. 32. f. 19.
BOT. PROV :—6.
WALES :—Pen Cow! near Fishguard, Pembrokeshire. (Sept. 1876.)
Spores .0155—.016 mm. long, .007 mm. broad.

** *Perithecium entire.*

§ *Spores colourless.*

142. *V. superposita*, Nyl. *apothecia black, turgid; perithecium entire, black;* epithecium impressed; paraphyses none; *spores* 8, colourless, ovoid, 1-*septate;* gelatina hymenea vinous-red with iodine.

Parasitic on *Verrucaria theleodes*, Smrft. very rare. 1865.

SYN :—Nyl. in Flora 1865. p. 357. Carroll in Seem. Journ. Bot. 4. 25.
GEOG. DISTRIB :—Europe.
BOT PROV :—15.
SCOTLAND :—Near the summit of Ben Lawers. *Mr. Carroll.* (1865.)
"Not unlike *V. Borreri*, in miniature. Spores .017—19 mm. long, .007—8 mm. broad." *(Nyl.)*

143. *V. innata*, Nyl. *apothecia innate*, minute; *perithecium entire, black;* paraphyses few, irregular or scarcely any; *spores* 8, colourless, ovoid, 1-*septate;* gelatina hymenea untinged or lutescent with iodine.

Parasitic on thallus of *Lecidea Hookerii*, Schær. in alpine localities, very rare. 1865.

SYN :—Nyl. in Flora 1865. p. 358. Carroll in Seem. Journ. Bot. 4. 26.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Adm. Jones.*
"Spores .018—23 mm. long, .008—.011 mm. broad." (*Nyl.*)

144. *V. epipolytropa*, (Mudd.) *apothecia black, very minute*, numerous, irregularly scattered, *immersed or semi-immersed*, globose, internally pale; *ostiolum denuded, plano-convex*, slightly shining; epithecium minutely poriform; *perithecium entire*, of a bluish-green hue; paraphyses distinct, slender, branched; *spores* 4, 6 or 8, colourless, *oblongo-subclavate*, 1-*septate, constricted*, minute, very similar in form to those of *V. epidermidis;* gelatina hymenea rubescent with iodine.

Parasitic on *Lecanora polytropa and intricata and Squamaria saxicola*, rare. 1861.

SYN :—*Thelidium*, Mudd Man. 298. (1861.)
EXS :—Mudd 287.
BOT. PROV :—7...10...15.
ENGLAND :—Cliffrigg! Ayton Moor, Cleveland. *Mr. Mudd.* (1861.)
SCOTLAND :—Highlands. *Adm. Jones.* Craig Tulloch. *Rev. J. M. Crombie.*
WALES :—Cwm Glas! Snowdon. Moel-y-Golfa!
"Spores .003 to .0035 in. long, by .00075 to .001 in. broad." (*Mudd.*)

§§ *Spores fuscous.*

145. *V. haplotella*, (Nyl.) apothecia minute, convex, prominent, aggregate, black; perithecium entire; *spores* numerous, pallido-nigrescent, ellipsoid or oblong, *simple.*

Parasitic on *Opegrapha varia f. diaphora*, very rare.

SYN :—*Endococcus*, Nyl. in Flora 1867. p. 180. Crombie En. 122.
GEOG. DISTRIB :—Denmark, Madeira.
BOT. PROV :—19.
IRELAND :—Muckruss Demesne, Killarney. *Mr. Carroll.*
"Spores .004—7 mm. long, .0029—.0030 mm. broad. Paraphyses indistinct. Gelatina hymenea and thecæ I vinous-red." (*Nyl.*)

146. *V. ventosicola*, (Mudd.) *apothecia* minute, semi-immersed *in minute thallodal verrucæ*, globose, black; perithecium entire; *spores* 30-50, fuscous, elliptical or oblong, 1-septate.

Parasitic on *Lecanora ventosa*, very rare. 1861.

SYN :—*Microthelia*, Mudd Man. 307. (1861.)
EXS :—Mudd 300. on Leight. 9.
GEOG. DISTRIB :—Europe.
BOT. PROV.—1...7...10.
ENGLAND :—Kildale Moor, Cleveland. *Mr. Mudd.* Dartmoor. *Mr. W. Joshua.*
WALES :—Penmaenmawr! Carnarvonshire.
"Spores .0015 in. long, by .0005 to .00075 in. broad." (*Mudd.*) Spores .008—.009 mm. long, .005 mm. broad.

147. *V. calcaricola*, (Mudd.) *apothecia* of medium size, *sessile* or slightly immersed, *globose*, black; perithecium entire; *spores* 8, fuscescent, elliptico-oblong, 1-septate, *large.*

Parasitic on *Lecanora cinerea*, *calcarea* and *gibbosa*, rare.

SYN :—*Microthelia*, Mudd Man. 306. (1861.)
FIG :—Mudd Man. t. 5. f. 128.
GEOG. DISTRIB :—Europe.
BOT. PROV :—2...5...15...23.
ENGLAND :—Near Lewes, Sussex. *Mr. Unwin.* Spout Valley, Long Mynd! Shropshire.
SCOTLAND :—Near Ben Lawers and Morrone. *Rev. J. M. Crombie.*
IRELAND :—Killiney. *Adm. Jones.*
"Spores .003 to .004 in. long, by .001 in. broad. t. 5. f. 128." (*Mudd.*) Spores .019—.020 mm. long, .006 mm. broad. Paraphyses gelatinose, I vinous-brown.

148. *V. gemmifera*, Tayl. *apothecia* minute, *semi-immersed, sub-hemispherico-globose*, black; perithecium entire; epithecium depressed; *spores* 8, fuscous, broadly oblong, 1-septate, *minute.*

Parasitic on *Lecidea contigua*, frequent. 1836.

SYN :—*Verrucaria*, Tayl. Fl. Hib. 2. 95. (1836.) Leight. Ang Lich. 47. *Endococcus*. Nyl. Pyr. 64. *Microthelia*, Mudd Man. 307.
FIG :—Leight. Ang. Lich. t. 29. f. 3.
EXS :—Leight. 137.
GEOG. DISTRIB :—Europe.
BOT. PROV :—1...5, 6, 7...10...15...19.
ENGLAND :—Craigforda! near Oswestry, Shropshire; Penzance, Cornwall. *Rev. T. Salwey.* Guisbro' Moor, Cleveland. *Mr. Mudd.* Haughmond Hill! Shropshire.
SCOTLAND :—Grampians. *Rev. J. M. Crombie.* Portree. *Rev. Prof. Ch. Babington.*
IRELAND :—Dunkerron! *Dr. Taylor.* (1836.)
WALES :—Barmouth! *Rev. T. Salwey.* Glyder Vach! Snowdonia. Llyn-y-Cae! Cader Idris. Trefriw! Fort Hill! near Fishguard, Pembrokeshire.
"Spores .002 in. long, by .001 in. broad." (*Mudd.*) "Spores .008—.011 mm. long, .006—7 mm. broad." (*Nyl.*) Spores .010—.012 mm. long, .006—.007 mm. broad.

149. *V. perpusilla*, (Nyl.) *apothecia* very minute, *immersed, globoso-depressed*, black; epithecium large; perithecium entire; spores 8, fuscous, oblong, 1-septate.

Parasitic on *Lecanora cinerea*, rare. 1869.

SYN:—*Endococcus*, Nyl. Prodr. 193. (1861.) Crombie En. 123.
GEOG. DISTRIB:—France.
BOT. PROV:—5...7...15...26.
ENGLAND:—Bisley, Gloucestershire. *Mr. Joshua.*
SCOTLAND:—Ben Cruachan. *Rev. J. M. Crombie.*
IRELAND:—Summit of Kylemore Mountain, co. Galway! *Mr. Larbalestier.*
WALES:—Llyn-y-Cae! Cader Idris. (1869.) Craig Aderyn!
"Spores .014—19 mm. long, .006—7 mm. broad. Spermatia oblongo-cylindrical." *(Nyl.)*

150. *V. erratica*, (Mass.) *apothecia* minute, *semi-immersed or sub-emersed*, globose, black; perithecium entire; *spores numerous*, fuscous, broadly-elliptical, half the size of those of *V. gemmifera*.

Parasitic on *Lecanora calcarea, Lecidea lapicida, Lecanora polytropa, Lecidea geographica*, &c., not unfrequent. 1851.

SYN:—*Tichothecium*, Mass.! Neag. p. 9. (1854.) *Endococcus*, Nyl. Scand. 283. *Verrucaria gemmifera var.* Leight. Ang. Lich. 47. *Microthelia pygmæa*, Kbr. Mudd Man. 307.
FIG:—Leight. Ang. Lich. t. 20. f. 4.
EXS:—Arn. 247. Anzi Langob. 289. Anzi Venet. 161.
GEOG. DISTRIB:—France, Italy, Pyrenees, Germany, Bavaria, Asia Minor.
BOT. PROV:—5, 6, 7...10, 11...15...18, 19...26...28.
ENGLAND:—Durham! *Rev. J. Harriman.* (1851.) near Battersby, Cleveland. *Mr. Mudd.* Cowcombe Wood, Gloucestershire. *Mr. Joshua.* Long Mynd! near Church Stretton; Caer Caradoc! Shropshire.
SCOTLAND:—Loch Coriskin! Skye. *Rev. Prof. Churchill Babington.* Head of Loch-na-Cat; Braemar. *Adm. Jones.* Grampians, Breadalbane, and Braemar. *Rev. J. M. Crombie.*
IRELAND:—Sheep walk, Armagh; Killiney; Dublin; Cusquniny; Cork Harbour. *Adm. Jones.* Mangerton. *Mr. Carroll.* Twelve Pins! Galway. *Mr. Larbalestier.*
WALES:—Crib Coch! Snowdon; Corwen! very summit of Snowdon! Barmouth! Cader Idris north side! Trefriw falls! Llanbedrog! Fort Hill! near Fishguard, Pembrokeshire. Great Orme's Head!
"Spores .001 in. long, by .005 in. broad." *(Mudd.)* "Spores .007—.010 mm. long, .004—6 mm. broad." *(Nyl.)* Spores .007—.008 mm. long, .004—.005 mm. broad.

151. *V. rimosicola*, Leight. thallus none; *apothecia black, minute, sessile, hemispherical*, somewhat shining; perithecium entire, black; epithecium a very minute pore; paraphyses none; filamenta ostiolaria none; *spores* 8, *fuscous*, oblong or lineari-oblong, 3-*septate*, constricted, minute; gelatina hymenea vinous-red with iodine.

Parasitic on *Lecidea excentrica*, frequent. 1856.

SYN:—Leight. Exs. 253. (1856.) Mudd Man. 308. *V. advenula*, Nyl. in Flora 1865. p. 606.
FIG:—Ann. and Mag. Nat. Hist. ser. 2. vol. 13. t. 3. f. 10.
EXS:—Leight. 253. Mudd 301. Anzi Langob. 370. Arn. 379. Hepp 947.
GEOG. DISTRIB:—Germany, Italy.
BOT. PROV:—5...10...15, 16...19...26, 27.
ENGLAND:—Carlton Bank! Cleveland. *Mr. Mudd.* Penhill, Yorkshire. *Mr. Baker.* Wrekin Hill! Shropshire. (1856.)
SCOTLAND:—Ben Lawers! *Adm. Jones.* Appin. *Rev. J. M. Crombie.*
IRELAND:—Killarney. *Adm. Jones.* Loughcooter, Galway. *Mr. Carroll.*
"Spores .0035 to .004 in. long, by .00125 to .0015 in. broad. t. 5. f. 129." *(Mudd.)* "Spores .015—20 mm. long, .006—8 mm. broad." *(Nyl.)*

152. *V. nigritella*, Nyl. *black*, magmoid (probably not the proper thallus but only algæ); *apothecia black, small*; *perithecium entire*, black, somewhat prominent; epithecium scarcely impressed; paraphyses none; *spores* 8, *fuscous*, ellipsoid or oblongo-ellipsoid, variously or murali-locular, small, (like those of *Urceolaria scruposa.*)

On the thalline squamæ of *Verrucaria tephroides*, very rare. 1864.

SYN :—Nyl. in Flora 1865. p. 357. Carroll in Seem. Journ. Bot. 4. 25.
FIG :—Leight. Ang. Lich. t. 11. f. 3. B.
GEOG. DISTRIB :—Europe.
BOT. PROV :—15.
SCOTLAND :—Summit of Ben Lawers. *Mr. Carroll.* (1864.)
"Spores .021—36 mm. long, .009—.014 mm. broad. Gelatina hymenea I vinous-red or fulvescent." (*Nyl.*)

153. *V. triphractoides*, (Nyl.) apothecia black, minute, hemispherical; perithecium entire; spores 8, colourless or pale-brownish, oblongo-fusiform, 3-septate.

Parasitical on dealbated portions of thallus of *Lecidea Scotinodes*, Nyl. 1874.

SYN :—Crombie in Grevillea 3. p. 24. (1874.)
BOT. PROV :—15.
SCOTLAND :—Craig Tulloch, Blair Athole. *Rev. J. M. Crombie.* (1874.)
"Spores .014—18 mm. long, .006—7 mm. broad." (*Cromb.*)

154. *V. neottizans*, Leight. *apothecia black*, minute, *clustered*, hemispherico-conical; *perithecium* carbonaceous, *entire*; paraphyses distinct, slender; *spores* 4, *fuscous, lineari-oblong*, 3-*septate, constricted.*

Parasitic on *Bœomyces rufus*, D.C. very rare. 1876.

SYN :—Leight. in Linn. Trans. 2d. ser. 1. 239.
FIG :—Linn. Trans. l. c. t. 32. f. 19.
BOT. PROV :—6.
WALES :—Llanachar Bridge! near Fishguard, Pembrokeshire. (1876.)
Gelatina hymenea I—. Spores .0245—.025 mm. long, .0085—.009 mm. broad.

155. *V. corniculata*, (Wallr.) apothecia very minute, immersed, tuberculate, endocarpoid, scattered; paraphyses none; spores 8, colourless, shortly fusiform, corniculate at each apex, obsoletely 7-septate.

Parasitic on thallus of *Leptogium microscopicum.*

SYN :—*Obryzum*, Wallr. Fl. Cr. Germ. 2. p. 296. Nyl. Flora 1875. p. 106.
FIG :—Nyl. Syn. t. 2. f. 9.
EXS :—Mass. 138.
GEOG. DISTRIB :—France.
BOT. PROV :—5.
ENGLAND :—Weston-super-Mare. *Mr. Joshua.*

156. *V. dolichotera*, (Nyl.) Similar to *V. corniculata*, but with spores longer, 3-5-septate, cylindrico-oblong.

Parasitic on lobes of *Collema auriculatum, var. pinguescens*, Nyl. 1870.

SYN :—Nylander in Flora 1872. p. 353.
BOT. PROV :—15.
SCOTLAND :—Craig Tulloch, Blair Athole. (1870.) *Rev. J. M. Crombie.*

## V. STRIGULA, *Fries.*

Thallus hypophlæodal. Apothecia solitary, sub-innate; perithecium sub-globose, collapsing, at length dehiscent by an irregular fissure or pore; nucleus gelatinous when moist, black and rigid when dry; paraphyses indistinct. Spores colourless, 3-septate.

1. *S. Babingtonii*, Berk. greyish, thin, filmy; apothecia dark-brown or nearly black, minute, scattered, depressed; spores 8, colourless, sub-cymbiform, 3-septate.

Parasitic on coriaceous perennial leaves, as laurel, box, arbutus, rare.

SYN:—Berk. E. Bot. Suppl. t. 2957. (1849.) Leight. Ang. Lich. 70. Mudd Man. 309.
FIG:—E. Bot. Suppl. t. 2957.
EXS:—Leight. 35.
GEOG. DISTRIB:—Europe.
BOT. PROV:—2...4, 5...7, 8...10, 11.
ENGLAND:—Cambridge! *Rev. Prof. Ch. Babington.* Gopsal! Leicestershire. *Rev. A. Bloxam.* Hurstpierpoint! *Mr. Mitten.* Ormsby! Cleveland; Rokeby, Durham. *Mr. Mudd.* Cirencester. *Mr. Joshua.*
WALES:—Downing! Flintshire. *Rev. Prof. Ch. Babington.*
"Spores .0035 to .004 in. long, by .001 in. broad. t. 5. f. 130." *(Mudd.)* Spores .018—.023 mm. long, .005—.007 mm. broad.

## VI. MELANOTHECA, *Fée.*

Thallus scarcely any. Apothecia verrucaroid, not simple but numerous, 3-10 or more confluent, hymenia scarcely distinct; perithecium black. Spores 8, variously internally divided.

1. *M. gelatinosa*, (Chev.) *pallescent*, macular, determinate; *apothecia round or oblong*, opake, depressed, unequal, internally white; *perithecia* numerous, *minute*; *spores* 8, *colourless*, oblongo-ovoid, 3-*septate*, *small*; paraphyses none; hypothecium colourless.

On young trees, frequent.

SYN:—*Arthonia*, Chev. Journ. Phys. 1822. p. 54. Nyl. Pyren. 70.
EXS:—Leight. 223. 358. Mudd 232. Rabh. 780.
GEOG. DISTRIB:—Switzerland, France.
BOT. PROV:—1, 2...5...7...10...15...(19—26—30)...31.
ENGLAND:—Sussex! *Mr. Borrer.* Baysdale! Cleveland. *Mr. Mudd.* Torquay! *Dr. Deakin.* Stableford! Raglith! Downton Castle woods! Shropshire.
SCOTLAND:—Glen Cluny, Braemar; Glen Lochay, Breadalbane. By side of the Garry. *Rev. J. M. Crombie.*
IRELAND:—Not frequent. *Mr. Carroll.* Lough Derryclare! Kylemore! co. Galway. *Mr. Larbalestier.*
WALES:—Woods at Glyn! and opposite Tanybwlch Hotel, Capel Curig! Dolgelley!
CHANNEL ISLANDS:—Rozel, Jersey. *Mr. Larbalestier.*
"Spores .023—27 mm. long, .007—.010 mm. broad." (*Nyl.*)

2. *M. diffusa*, Leight. *pallido-glaucescent or pallido-cinerascent*, diffuso-macular, indeterminate; *apothecia large, irregularly round, or lineari-oblong*, numerous, *diffuse and sub-confluent*, opake, depressed, unequal, internally colourless; *perithecia* numerous, *prominent and large*; *spores* 8, *fuscous*, lineari-oblong, 1-*septate*, constricted in the middle, *large*.

On young trees, rare. 1865.

GEOG. DISTRIB :...Europe.
BOT. PROV :—7.
WALES :—Nant-Gwynant ! Snowdon. (1865.) wood opposite Tanybwlch Hotel, Capel Curig !
Spores .022—.026 mm. long, .005 mm. broad.

3. *M. ischnobela*, Nyl. *glaucescent*, whitish; *apothecia black*, somewhat convex, *rotundate or suboblong* ; *perithecium black, dimidiate* ; *hymenea* 2-4 in each apothecium, contiguous, oblique, and confluent at the apex ; ostiolum scarcely any ; spores 8, colourless, excessively slender and *acicular, oleoso-spuriously multiseptate* ; gelatina hymenea I—.

On holly, rare. 1876.

SYN :—Nyl. in Flora 1876. p. 238. *Verrucaria myriospora*, Linn. Trans. 2. s. 1. 145.
FIG :—Linn. Trans. l. c. t. 22. f. 1. 2. 3. excl. f. 4, 5. which are erroneous.
BOT. PROV :—26.
IRELAND :—Doughruagh Mountain ! *Mr. Larbalestier*. (1876.) Dolgelley !
"Gonidia subchroolepoideo-concatenate. Thecæ cylindrical, elongate. Paraphyses very slender, crowded. Spores .060—.115 mm. long, .001 mm. broad." (*Nyl.*)

## VII. ASTROTHELIUM, *Eschw.*

Perithecia several, stellato-congregate, their ostiola converging into one common central poriform epithecium.

1. *A. parmularia*. (Berk.) pale-yellow, thin, membranous, continuous, smoothish and shining ; apothecia enclosed in upraised prominent thallodal verrucæ ; perithecium entire, black ; paraphyses indistinct ; spores 8, fuscous, broadly lineari-oblong, 1-septate, large.

On young oaks, very rare. 1851.

SYN :—*Sphæria parmularia*, Berk. in Hook. Journ. 1851. p. 19.
GEOG. DISTRIB :—South of France.
BOT. PROV :—2.
ENGLAND :—New Forest, Hants. *Rev. M. J. Berkeley*. (1851.)
Spores .037 mm. long, .015—.016 mm. broad.

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"Quanquam multas observaverim plantas et sedulo quidem, tamen non confido me semper veritatem invenisse."

LINN.

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*Mass. Ric.* Massalongo, Richerche sull'autonomia dei Lichenum, 1852.
*Mass. Gen.* Massalongo, Geneacæna Lichenum, 1854.
*Mass. Symm.* Massolongo, Symmicta Lichenum, 1855.
*Mass. Sert.* Massalongo, Sertum, 1856.
*Mudd Man.* Mudd, Manual of British Lichens, 1861.
*Mont. Lich. Canar.* Montagne, Lichenes Canarienses, 1840.
*Mont. Syll.* Montagne, Sylloge, 1856.
*Mont. & Dur.* Montagne and Durieu, Exploration scientifique de l'Algerie, 1846.
*Mont. Arch.* Montagne, in Archives de Botanique, 1833.
*Nov. Act. Upsal.* Nova Acta Academiæ Upsaliæ, 1782.
*Nyl. Coll.* Nylander, Collectanea Galliæ Meridionalis et Pyrenæis, 1853.
*Nyl. Luxemb.* Nylander, Luxembourg Lichens in Bulletin Soc. Scient. France, 1866.
*Nyl. in Ofvers.* Nylander, in Ofvers, V. Ak. Forh. 1860.
*Nyl. En.* Nylander, Enumeration gènèrale des Lichens, 1858.
*Nyl. Lich. Ægypt.* Nylander, Lichenes in Ægypto a cel. Ehrenberg collecti, 1864.
*Nyl. Nov. Gran.* Nylander, Prodromus Floræ Novæ Granatensis, 1863—1864.
*Nyl. Alger.* Nylander, Etudes sur les Lichens de l'Algerie, 1857.
*Nyl. Delp.* Nylander, circa lichenes alpium Delphinatus obs. 1863.
*Nyl. Bot. Not.* Nylander, in Botaniska Notiser, 1852—1854.
*Nyl. Obs. Holm.* Nylander, Observationes ad Synopsin Lichenum Holmiensium, 1852.
*Nyl. Animad.* Nylander, Animadversiones Scand. in Botaniska Notiser, 1853.
*Nyl. Addit. Chil.* Nylander, Additamentum in Floram Cryptogamicam Chilensem, 1863.
*Nyl. Armor.* Nylander, Lichenes in Armorica, in Bulletin Societe Botanique de France, 1861.

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| *Nyl. in Sallsk.* | Nylander in Sallskapets pro Fauna et Flora Fordhandlingar, 1859. |
| *Nyl. Prodr.* | Nylander, Prodromus Lichenographiæ Gallicæ et Algeriæ, 1857. |
| *Nyl. Syn.* | Nylander, Synopsis methodica lichenum omnium, tom. 1. 1858. |
| *Nyl. Scand.* | Nylander, Lichenes Scandinaviæ, 1861. |
| *Nyl. Lapp. Or.* | Nylander, Lichenes Lapponiæ orientalis, 1866. |
| *Nyl. in Flora.* | Nylander, in Flora, various years. |
| *Nyl. Calic.* | Nylander, Monographia Caliciorum, 1857. |
| *Nyl. in Mus. Fenn.* | Nylander, Herbarium Musei Fennici, 1859. |
| *Nyl. Classif.* | Nylander, Essai d'une nouvelle Classification des Lichens, 1854—1855. |
| *Nyl. Addit. N. Gran.* | Nylander, Additamenta ad Floram Novæ Granatensis, 1864. |
| *Nyl. Chil.* | Nylander, Chilensis Flor. Cryptog. 1855. |
| *Nyl. Pyren.* | Nylander, Expositio synoptica Pyrenocarpeorum, 1858. |
| *Nyl. Arth.* | Nylander ,Synopsis du genre Arthonia, 1856. |
| *Neck. Delic.* | Necker, Deliciæ Gallobelgicæ, 1768. |
| *Pers. Obs. Myc.* | Persoon, Observationes Mycologicæ, 1799. |
| *Pers. Ust. Ann.* | Persoon, in Usteri Annales, 1794—95. |
| *Pers. Syn.* | Persoon, Synopsis Fungorum, 1801. |
| *Pers. Icon.* | Persoon, Icones et Descriptiones Fungorum, 1799. |
| *Pers. Fung. Suppl.* | Persoon, Tentamen Dispositionis Fungorum Supplementum, 1797. |
| *Poll. Pal. El.* | Pollich, Historia Plantarum in Palatinatu Electorali, 1777. |
| *Rebent. Fl.* | Rebent, Flora Neomarchia, 1804. |
| *Ram. Act.* | Ramond, in Acta Societe Linneene de Paris, 1827. |
| *Ram. Fl. Fr.* | Ramond, in Decandolle Flore Francaise. |
| *Schær. Spic.* | Schærer, Lichenum Helveticorum Spicilegium, 1823 -1846. |
| *Schær. En.* | Schærer, Enumeratio critica, 1850. |
| *Schær. in Nat.* | Schærer, in Nat. Anz. 1810-1821. |
| *Sw.* | Swartz, in Linnei filii Methodo Muscorum, 1805. |
| | Swartz, in Nova Acta Upsaliæ, 1776. |
| | Swartz, Flora Indiæ orientalis, 1806. |
| *Scop. Carniol.* | Scopoli, Flora Carniolica, 1760-1772. |
| *Sm. in Tr. L. S.* | Smith in Transactions Linnean Society, 1791. |
| *Schrank Bay.* | Schrank, Bayer Flora, 1789. |
| *Schreb. Spic.* | Schreber, Spicilegium Floræ Lipsiensis, 1771. |
| *Schleich. Cent.* | Schleicher, Centuriæ, 1805—7. |
| *Stizb. Stein. Opeg.* | Stizenberger, Conspectus specierum saxicolarum generis Opegraphæ, 1865. |
| *Stizb. Flecht.* | Stizenberger, Beitrag zur Flechten Systematik, 1862. |
| *Smrf. Lapp.* | Sommerfeldt, Supplementum Floræ Lapponiæ, 1826. |
| *Schrad. Spic.* | Schrader, Spicilegium Floræ Germanicæ, 1794. |
| *Schrad. Crypt.* | Schrader, Cryptogamæ Exsiccatæ, 1797. |
| *Schrad.* | Schrader, in Journal Botanique, 1801. |
| *Sturm D. Fl.* | Sturm Deutsche Flora, 1833. |
| *Salw. Penz.* | Salwey, in Transactions Penzance Natural History Society, 1853. |
| *Salw. Ed.* | Salwey, in Transactions Edinburgh Botanical Society, 1846 et seq. |
| *Tuck. Syn.* | Tuckermann, Synopsis Lichens North America, 1845. |
| *Tuck. Suppl.* | Tuckermann, Supplement to North American Lichens, 1858 —1859. |
| *Tul. Mem. Lich.* | Tulasne memoire pour servir a l'histoire des lichens, 1852. |
| *Tayl. Fl. Hib.* | Taylor, in Mackay Flora Hibernica, 1836. |
| *T. & B. Lich. Br.* | Turner and Borrer, Lichenographia Britannica, 1839. |
| *Thunb. Fl. Cap.* | Thunberg, Flora Capensis, 1794. |
| *Vaill. Paris.* | Vaillant, Botanicum Parisiense, 1727. |
| *Vahl* | Vahl, in Flora Danica, 1769–1808. |
| *Ust. N. Ann.* | Usteri, Novæ Annales, 1794. |
| *With. Arr.* | Withering, Arangement, 1796. |
| *Weis. Cr.* | Weis, Plantæ Cryptogamicæ Floræ Gottingensis, 1772. |
| *Whlnbg.* | Wahlenberg, in Vet. Ak Holm, 1806. |
| | Wahlenberg, Flora Suecica, 1826. |
| | Wahlenberg, Flora Lapponica, 1812. |

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| *Wallr. Crypt.* | Wallroth, Compendium Floræ Germanicæ, 1831. |
| *Weig. Obs.* | Weigel, Observationes Botanicæ, 1772. |
| *Westr. Faerg.* | Westring, Sevenska Lafvarnes Farghistoria, 1805. |
| *Web. Spic.* | Weber, Spicilegium Floræ Gottingensis, 1778. |
| *Wulf.* | Wulfen, in Jacquin's Collectanea, 1786—1796. |
| *Weddell* | Weddell, in Bulletin Societe Botanique de France, 1869. |

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## LICHENES EXSICCATI QUOTED.

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| *Anzi It. S.* | Anzi, Lichenes Italiæ Superioris. |
| *Anzi Venet.* | Anzi, Lichenes rariores Veneti. |
| *Anzi Langob.* | Anzi, Lichenes rariores Langobardi. |
| *Anzi Etr.* | Anzi, Lichenes rariores Etruriæ. |
| *Anzi Clad. Cisalp.* | Anzi, Cladoniæ Cisalpinæ. |
| *Arn.* | Arnold, Lichenes Exsiccati Juræ et al. |
| *Bohl.* | Bohler, Lichenes Britannici Exsiccati. |
| *Bourg.* | Bourgeau, Plantæ Canarienses. |
| *Breutel.* | Breutel, Flora Germanica Exsiccata. |
| *Coem. Clad. Belg.* | Coeman, Cladoniæ Belgicæ. |
| *Desmaz.* | Desmazieres, Cryptogames de France. |
| *Dicks.* | Dickson, Exsiccati. |
| *Fellm.* | Fellman, Lichenes Lapponiæ orientalis. |
| *Fries* | Fries (E.) Lichenes exsiccati Sueciæ. |
| *Th. M. Fr.* | Th. M. Fries, Lichenes Scandinaviæ. |
| *Hepp* | Hepp, Die Flechten Europas. |
| *Hampe* | Hampe, Lichenes Exsiccati. |
| *Korb.* | Koerber, Lichenes Exsiccati. |
| *Larbal.* | Larbalestier, Lichenes Cæsarienses et Sargienses. |
| *Leight.* | Leighton, Lichenes Britannici Exsiccati. |
| *Lindig.* | Lindig, Lichenes Novæ Granadæ. |
| *Lojka.* | Transylvanian Lichens. |
| *M. & N.* | Mougeot et Nestler, Stirpes Cryptogamæ Vogeso-Rhenanæ. |
| *Mudd* | Mudd, Lichenes Britannici Exsiccati. |
| *Mudd Clad. Brit.* | Mudd, Cladoniæ Britannicæ Exsiccatæ. |
| *Maudon.* | Maudon, Maderæ. |
| *Mass.* | Massalongo, Lichenes Italici. |
| *Nyl.* | Nylander, Herbarium Lichenum Parisiensium. |
| *Rabh.* | Rabenhorst, Lichenes Europæi. |
| *Reich. & Schub.* | Reichenbach et Schubert, Lichenes Exsiccati, 150 nôs. 1823—1826. |
| *Schær.* | Schærer, Lichenes Helvetici Exsiccati. |
| *Somft.* | Sommerfelt, Plantarum Cryptogamicarum Norvegicarum centuriæ II. 1826–1830. |
| *Spruce Amaz.* | Spruce Lichenes Amazonici et Andini. |
| *Stenh.* | Stenhammar, Lichenes exsiccati Sueciæ. |
| *Tuck.* | Tuckerman, Lichenes Americæ Septentrionalis. |
| *Wright* | Wright, Lichenes Cubæ. |
| *Welw. Lus.* | Welwitszch, Lichenes Lusitanici. |
| *Zw.* | Zwackh, Lichenes Germanici Exsiccati. |

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# GLOSSARY OF TERMS

USED IN

# LICHENOLOGY.

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*Abbreviated*, suddenly shortened.
*Abraded*, roughly rubbed off.
*Acervuli*, little heaps or clusters.
*Acicular*, needle-shaped.
*Aciculari-bacilliform*, needle-like and somewhat club-shaped.
*Aciculari-cylindrical*, a needle-like cylinder-shape.
*Aciculari-fusiform*, of an acicular or very slender spindle-shape.
*Acuminate*, coming gradually to a point.
*Adnate*, adhering to anything.
*Adnato-appressed*, adnate and closely pressed to a surface.
*Adnato-squamulose*, with adnate scales.
*Adpresso-tomentellose*, with appressed close down.
*Adscendenti-congested*, crowded together and ascending.
*Æruginose*, verdigris-green.
*Affixed*, fixed to.
*Agglomerated*, clustered.
*Aggregate*, crowded together.
*Aggregato-acervulate*, in crowded heaps.
*Aggregato-confluent*, flowing together in crowded portions.
*Aggregato-conglomerate*, in crowded clusters.
*Aggregato-deformed*, deformed by being crowded together.
*Albescent*, growing white.
*Albicant*, growing whitish.
*Albido-appresso-tomentellose*, with whitish appressed down.
*Albido-bullate*, whitely bullate.
*Albido-cinereous*, whitish-ashy-grey.
*Albido-cinerascent*, whitish becoming ashy.
*Albido-flavescent*, whitish-yellow.
*Albido-glaucescent*, whitish glaucous.
*Albido-granulose*, with whitish-granules.
*Albido-pallescent*, pale and whitish.
*Albido-papillate*, with whitish papillæ.
*Albido-pruinose*, with white pruina.
*Albido-radiate*, in whitish radiations.
*Albido-stramineous*, whitish-straw-coloured.
*Albido-tomentellose*, covered with whitish down.
*Albo-cæsio-pruinose*, with white bluish-grey pruins.
*Albo-canescent*, with a white hoariness.
*Albo-carneous*, pale-flesh-colour.
*Albo-cinereous*, white-ashy-grey.
*Albo-depresso-granulate*, covered with white flattened granules.
*Albo-fibrilloso-ciliate*, ciliate with white fibrillæ.
*Albo-flavescent*, pale-yellow.
*Albo-flocculose*, with white woolly down.
*Albo-furfuraceous*, with white scurf.
*Albo-fuscescent*, white-brownish hue.
*Albo-granulato-pulverulent*, with white granular powder.
*Albo-granulato-pruinose*, with pruina consisting of white granules.
*Albo-guttate*, spotted with white.
*Albo-limitate*, bounded by a white hypothallus.
*Albo-maculate*, having white spots or dots.

*Albo-macular*, consisting of a white spot or patch.
*Albo-ocellate*, surrounded with a white thalline margin, giving an eye-like appearance.
*Albo-pruinose*, with white pruina.
*Albo-pulverulent*, having white powder.
*Albo-sorediate*, with white soredia.
*Albo-suffused*, covered with white powder or pruina.
*Albo-tomentose*, with white tomentum.
*Albo-verrucose*, having white warts.
*Albo-virescent*, whitish-green.
*Alectorioid*, filiform or filamentose, like the thallus of the genus *Alectoria*.
*Anastomosing*, uniting in a network.
*Angular*, with many sharp-cut straight sides.
*Angulari-areolato-verrucose*, consisting of angular warty areolæ.
*Angulari-nucleolate*, with angular shaped nuclei.
*Anguloso-difformed*, angular and deformed by crowding.
*Anguloso-rimose*, broken into angular portions by chinks.
*Angustissimo-divided*, divided into the very narrowest laciniæ.
*Annulari-tomentose*, having a ring of down.
*Apex*, the end or point.
*Apically*, at the apex.
*Apiculate*, terminating abruptly in a little point.
*Apiculi*, minute points.
*Apothecium*, the entire female fructification of a lichen.
*Appendiculate*, an apothecium subtended by the apex of a branch or lacinia extending beyond it.
*Applanate*, flattened out or horizontally expanded.
*Applanato-dilated*, broad and flattened out.
*Appressed*, pressed closely to anything.
*Appresso-furfuraceous*, having appressed scurf.
*Appresso-innate*, closely pressed to, and partially innate or sunken.
*Appresso-spongioso-tomentose*, having a close-pressed spongy tomentum.
*Appresso-tomentose*, with appressed tomentum.
*Approximate*, approaching.
*Arachnoid*, cobwebbed.
*Arachnoideo-tomentose*, having a loose tomentum or down hanging about like a cobweb.
*Arcuate*, curved like a bow.
*Arcuato-rugulose*, wrinkled in an arcuate or curved manner.
*Ardellæ*, the peculiar apothecia in the genus *Arthonia* resembling burnt or cauterised spots.
*Areolato-imbricato-crustaceous*, with overlapping areolæ almost crusty.
*Areolato-impressed*, impressed in the areolæ.
*Areolato-papillate*, divided into papillate areolæ.
*Areolato-rimose*, divided into areolæ by chinks.
*Areolato-squamulose*, consisting of flattened scaly areolæ.
*Areolato-verrucose*, consisting of wart-like areolæ.
*Arthonoid*, of the form and consistence of the apothecia in the genus *Arthonia*.
*Articulate*, jointed.
*Articulato-constricted*, having contracted joints.
*Arthrosterigmata*, jointed sterigmata.
*Ascending*, bending upwards in an upward direction.
*Ascendenti-imbricate*, ascending and overlapping.
*Asci*, small hyaline bladders containing the spores.
*Ascyphous*, without scyphi or cups.
*Atro-cinerascent*, black or dark-ashy-grey.
*Atro-rhizinose*, having black rhizinæ.
*Atro-rufous*, dark and blackish-red.
*Attenuate*, tapering upwards and becoming thin.
*Attenuato-fusiform*, slenderly spindle-shaped.
*Attenuato-subulate*, tapering upwards into an awlshape form.
*Aurantiaco-ochraceous*, of an orange-ochrey colour.
*Axil*, the fork of a branch.
*Bacillar*, } club-shaped.
*Bacilliform*, }
*Badious*, dull-brown.
*Badio-castaneous*, dull-dark-chestnut.

*Badio-fuscescent*, dull-dark-brownish colour.
*Badio fuscous*, dull-dark-brown.
*Badio-pallescent*, dull pale-brown.
*Badio-rufescent*, dull-reddish-brown.
*Badio rufous*, dull dark-red-brown.
*Badio-umbrine*, of a dull-dark-umber colour.
*Biatorine*, from Fries's genus *Biatora*, in which the apothecium had a proper margin of a different colour from the epithecium or was convex without visible margin, and internally with a pale or colourless hypothecium.
*Biatorino-lecideine*, an apothecium becoming convex and destitute of margin either proper or thalline.
*Bifurcate*, twice forked.
*Bilocular*, having two cells cut as it were out of a solid spore in contradistinction to 1-septate.
*Binucleolate*, with two nuclei.
*Branched*, in contradistinction to simple or unbranched
*Brunneo-fuscous*, dull-brown.
*Brunneo-infuscate*, dull-darkish-brown.
*Bullate*, with unequal convex projections on the under surface of a scrobiculate thallus, corresponding to the concave scrobiculations on the upper surface.
*Bullato-plicate*, plaited into swollen masses.
*Bullato-reticulato-tomentose*, bullate in a reticulate manner, the reticulations being downy.
*Byssoid*, of a finely filamentous structure like the genus *Byssus*.
*Cœrulescent*, of a blue colour, variable in intensity.
*Cœrulescenti-fuscescent*, bluish-brown.
*Cœruleo-cinerascent*, blue-ashy-grey.
*Cœruleo-fuscescent*, bluish-brown.
*Cœruleo-nigricant*, of a bluish-black colour.
*Cœruleo-pruinose*, with blue pruina.
*Cœruleo-virescent*, bluish-green.
*Cæsious*, bluish-grey.
*Cæsio-cinerascent*, blue-grey passing into ashy-grey.
*Cæsio-nigricant*, greyish-black.
*Cæsio-pruinose*, having bluish-grey pruina.
*Cæsio-pulverulento-sorediose*, having greyish powdery soredia.
*Cæsio-sorediate*, with greyish soredia.
*Cæsio-suffused*, covered with grey pruina.
*Cæsious-white*, greyish-white.
*Cæspitellose*, of a minute clustered branched conglomerate form.
*Cæspitose*, in clustered branched agglomerations.
*Cæspitoso-congested*, in crowded tufts.
*Cæspitoso-fruticulose*, in shrub-like tufts.
*Cæspitoso-pulvinular*, in dense tufted cushion-like masses.
*Calcivorous*, eating into the lime rock.
*Canaliculate*, longitudinally channelled or furrowed.
*Canaliculato-laciniate*, channelled and laciniate.
*Canaliculato-patulous*, channelled but still spreading outwards.
*Cancellato-insculpted*, sculptured in a kind of reticulation.
*Canescent*, hoary.
*Capillary*, delicately filiform or like hairs.
*Capitate*, formed into a head.
*Capitulum*, the portion of the apothecium in the genus *Calicium* which is on the top of the stipes.
*Capituliform*, having a capitulum or head.
*Carbonaceous*, black like charcoal.
*Carioso-cancellate*, decayed in a network manner.
*Carneo-cinerascent*, greyish-flesh-coloured.
*Carneo-fulvescent*, tawny-flesh-coloured.
*Carneo-fuscescent*, brownish-flesh-colour.
*Carneo-pallid*, pale-flesh-coloured.
*Carneo-rufescent*, pale-reddish-flesh-colour.
*Carneo-rufous*, reddish-flesh-coloured.
*Carneo-testaceous*, yellowish-brown-flesh-coloured.
*Cartilaginous*, hard or tough like a cartilage or sinew.
*Cartilagineo-corticate*, having the cortical layer of a cartilaginous consistence.

*Cartilagineo-membranaceous*, of a consistence intermediate between cartilaginous and membranous.
*Cartilagineo-squamose*, the squamæ of a thallus being of a tough cartilaginous consistence.
*Castaneo-fuscescent*, pale chestnut-brown.
*Castaneo-fuscous*, of a dark-chestnut-brown.
*Castaneo-olivaceous*, of a chestnut-brown-olive-colour.
*Castaneo-nigricant*, chestnut-black.
*Castaneo-rufescent*, chestnut-brown with a reddish tinge.
*Cellulose*, consisting of cellules.
*Cephalodia*, granular concretions of an orbicular form occurring on the thallus composed internally of granula gonima.
*Cephaloid*, having a globose or hemispherical head.
*Cephalodine*, forming a head.
*Ceraceo-gelatinose*, waxy and gelatinous.
*Ceraceo-membranaceous*, consisting of a waxy membrane.
*Cerasino-rufescent*, cherry-red.
*Cervine*, dark-tawny.
*Cervino-castaneous*, dark-tawny-chestnut-brown.
*Cervino-fuscescent*, tawny-brownish.
*Cervino-lutescent*, tawny-yellowish.
*Cervino-rufescent*, tawny-reddish.
*Chroolepoid*, consisting of minute yellow scales.
*Ciliato-dentate*, toothed with ciliæ or hairs.
*Ciliato-dissected*, cut into ciliæ or hair-like laciniæ.
*Cinerascent*, approaching an ashy-grey colour.
*Cinerascenti-fuscescent*, of an ashy-grey-brownish hue.
*Cinereous*, ashy-grey.
*Cinereo-albescent*, ashy-grey becoming whitish.
*Cinereo-carneous*, of an ashy-grey-flesh-colour.
*Cinereo-cærulescent*, ashy-grey verging towards blue.
*Cinereo-ferruginous*, ashy-rust colour.
*Cinereo-flavescent*, ashy-grey yellow.
*Cinereo-fuscescent*, ashy-brown.
*Cinereo-glaucescent*, glaucous-ashy-grey.
*Cinereo-glaucous*, ashy-grey-glaucous hue.
*Cinereo-lurid*, of a dull-ashy hue.
*Cinereo-nigrescent*, ashy-blackish.
*Cinereo-nigricant*, ashy-black.
*Cinereo-pallescent*, pale-ashy.
*Cinereo-pruinose*, with ashy-grey pruina.
*Cinereo-rufescent*, ashy-reddish.
*Cinereo-suffused*, covered with ashy-grey powder or pruina.
*Cinereo-virescent*, ashy-green.
*Cinnamoneo-cinerascent*, cinnamon-greyish.
*Circumcised*, applied to an apothecium which is separated from the thallus by a distinct rima or chink.
*Circumference*, the exterior edge or margin of a thallus.
*Circumscribed*, defined.
*Citrine*, yellow-green.
*Citrino-flavescent*, yellow like a lemon.
*Citrino-pulverulent*, having powder of a citrine colour.
*Citrino-sorediate*, having citrine soredia.
*Citrino-suffused*, covered with citrine powder.
*Citrino-virescent*, yellow-green as in a lemon.
*Clavæform*, club-shaped.
*Clavate*, club-shaped.
*Clavato-capitate*, with a head or apex of a club-shaped or wedge-shaped form.
*Clavato-cylindrical*, elongated club-shaped.
*Clavato-pyriform*, of club-shaped or elongate pear-shape.
*Coarctate*, closely pressed.
*Colliculoso-verrucose*, in hilly or elevated verrucæ.
*Colourless*, without colour, pale and hyaline, in contradistinction to brown.
*Compact*, closely united together.
*Complicate*, folded or plaited together.
*Complicato-compound*, apothecia becoming compound by close confluence or by complications of the margin.

*Compressed*, laterally flattened.
*Concatenate*, united in a chain-like manner.
*Concave*, with a more or less depressed or sunken rounded surface.
*Concentric*, ring within ring having a common centre.
*Concentrically-gyrose*, whirled or gyrose, ring within ring.
*Conceptacle*, receptacle.
*Concolorous*, similar in colour.
*Concrescenti-areolate*, the areolæ growing together in a somewhat clustered form.
*Concrete*, growing together.
*Confluent*, merging into each other.
*Confluento-effuse*, spread out in a conjoined or confused condition.
*Congested*, heaped together.
*Conglobate*, in rounded clusters.
*Conglomerate*, clustered.
*Conglomerations*, clusters.
*Conglomerato-deformed*, becoming deformed by being clustered or crowded.
*Conglomerato-granulose*, of clustered granules.
*Conglutinated*, glued together.
*Connate*, arranged together.
*Connato-deformed*, deformed by growing in close contact.
*Connivent*, arching over as if to meet.
*Conoid*, conelike.
*Conoideo-subtruncate*, like a truncate or flattened cone.
*Constricted*, contracted.
*Contiguous*, a continuous surface.
*Continuous*, having an unbroken surface.
*Contorted*, twisted together.
*Converging*, tending towards one common centre or point.
*Convex*, with a more or less elevated rounded surface.
*Convexo-conical*, convex with a conical apex.
*Convexo-gibbous*, convex and enlarged on one side.
*Convexo-unequal*, of unequal convexity.
*Coralloid*, coral-like.
*Coralloideo-granuloso-crustaceous*, of a crustaceous consistence formed of coral-like granules.
*Coralloideo-squamulose*, squamæ of a coralloid form.
*Coriaceous*, of a leathery consistence.
*Coriacco-membranaccous*, like a leathery membrane.
*Corniculato-convolute*, rolled together inwards like a little horn.
*Corneous*, of horny consistence.
*Corneo-hyaline*, transparent like horn.
*Cornute*, shaped like a horn.
*Corrugate*, roughened with wrinkles.
*Cortex*, the cortical layer.
*Cortical layer*, the epidermis of a thallus.
*Corticate*, covered with a cortical layer.
*Crenate*, having shallow rounded divisions on the margin.
*Crenato-dentate*, with crenate teeth.
*Crenato-granulose*, having shallow rounded marginal divisions composed of granules.
*Crenato-incised*, deeply cut in a crenate form.
*Crenato-lobulate*, with minute crenate lobes.
*Crenato-rugose*, crenate and wrinkled.
*Crenato-undulate*, crenate and wavy.
*Crenulate*, having very minute shallow rounded marginal divisions.
*Crenulato-denticulate*, with minute crenulate teeth.
*Crenulato-granulate*, having minute shallow rounded marginal divisions composed of granules.
*Crenulato-lobate*, lobed in minute rounded marginal divisions.
*Cretaceous*, chalky-white.
*Crispate*, crisped.
*Crisped*, irregularly curled and twisted.
*Cristato-ramose*, crested and branched.
*Crocco-fulvous*, tawny saffron-coloured.
*Crowded*, clustered, or many together.
*Crustaceous*, hard, thin, and brittle.

*Crustaceous*, applied to a thallus which is closely appressed to the substance on which it grows in contradistinction to membranaceous.
*Crustaceo-cartilaginous*, between crustaceous and cartilaginous.
*Crustaceo-concrescent*, growing together into a crust.
*Crustaceo-granulose*, a crustaceous thallus composed of distinct granules.
*Crustaceo-imbricate*, squamæ of a crustaceous consistence overlapping each other.
*Crustose*, forming a crust.
*Cucullato-revolute*, rolled back into a cowl shape.
*Cupular*, cup-shaped.
*Cupuliform*, like a little cup.
*Cuspidate*, abruptly pointed.
*Cyathiform*, cup-shaped like a reversed cone.
*Cyathoid*, like a cup or a reversed cone.
*Cylindrical*, having a true cylindrical figure like a pipe.
*Cylindrico-acicular*, cylindrically needle-shaped.
*Cylindraceo-fusiform*, a cylindrical form tapering to a point at both ends.
*Cylindraceo-oblong*, narrow oblong.
*Cyphellate*, minute sunken roundish cup-like spots on the under surface of the thallus of the *Stictei*.
*Cyphellæ*, minute urceolate excavations on the under surface of the thallus.
*Dactylino-papillate*, consisting of papillæ which are divided like fingers.
*Decorticate*, deprived of the cortical layer.
*Decumbent*, reclining on the earth and rising again from it at the apex.
*Decussate*, alternately crossing each other.
*Dehiscent*, ruptured or split open.
*Dehiscing*, rupturing.
*Deliquescing*, dissolving.
*Dendritical*, branched like a tree.
*Denigrate*, blackened.
*Dentate*, toothed.
*Dentato-radiate*, with minute teeth spreading in a ray-like manner.
*Denticulate*, with minute teeth.
*Denticulato-cristate*, crested with minute teeth.
*Denticulato-dilated*, expanded at the toothed margin.
*Denticulato-laciniate*, laciniate or cut into minute teeth.
*Denticulato-ruptured*, ruptured in tooth-like fashion.
*Denticulato-stellate*, minute teeth spreading in a star-like manner.
*Deplanate*, flattened or expanded.
*Depressed*, pressed down or flattened.
*Depresso-adnate*, depressed and closely adhering.
*Depresso-areolate*, divided into flattened areolæ.
*Depresso-concave*, depressed into a concave hollow.
*Depresso-convex*, flattened convex.
*Depresso-granulate*, covered with flattish granules.
*Depresso-hemispherical*, hemispherical and depressed or flattened on the apex.
*Depresso-implexed*, entangled in a depressed or flattened manner.
*Depresso-pulvinar*, composed of depressed or flattened cushion-like masses.
*Depresso-verrucarioid*, like depressed warts.
*Determinate*, definite in contradistinction to *effuse*.
*Dichotomous*, having the division always in pairs.
*Difluent*, dissolving.
*Difformed*, deformed.
*Difformi-lobate*, lobed in an irregular or deformed manner.
*Diffract*, broken into distinct areolæ separated by chinks.
*Diffracto-insculpt*, a surface broken up and sculptured.
*Diffracto-unequal*, unequally broken up.
*Diffuse*, spreading in an indeterminate way.
*Diffuso-macular*, consisting of a diffuse or expanded irregular spot or patch.
*Digitate*, divided like the fingers of the human hand.
*Digitato-dentate*, with finger-like teeth.
*Digitato-lobate*, in finger-like lobes.
*Digitaot-multifid*, cut into numerous finger-shaped laciniæ.
*Digitato-partite*, divided into finger-like divisions.
*Dilated*, expanded or spread out horizontally.
*Dilatato-compressed*, dilated and compressed.
*Diluto-nigrescent*, pale-washy-blackish.

*Dimidiate*, applied to a perithecium which covers only the upper half of the apothecium as in some species of *Verrucaria*.
*Dirinoid*, like the apothecium in the genus *Dirina*; see *tuberculoso-lecanorine*.
*Disciformi-dilated*, dilated or expanded into a disk-like form.
*Discoid*, disk-like.
*Discolorous*, of a different colour.
*Discrete*, separate and distinct.
*Dispersed*, scattered.
*Disperso-areolate*, consisting of scattered areolæ.
*Disperso-glebulose*, in dispersed portions like crumbs.
*Disperso-granulate*, with scattered granules.
*Disperso-verrucoso-areolate*, consisting of scattered verrucose areolæ.
*Dissected*, cut.
*Dissecto-fimbriate*, cut into a fringed margin.
*Disticho-ramose*, branched on opposite sides or margins.
*Distinct*, easily discernible as applied to the paraphyses.
*Divaricate* spreading in opposite directions.
*Divaricato-bifid*, cut into two parts and each of those parts spreading in opposite directions.
*Divaricato-fibrillose*, fibres spreading divaricately.
*Divaricato-lobate*, lobes spreading in a divaricate manner.
*Divaricato-multifid*, cut into many divaricating laciniæ.
*Divaricato-ramose*, branched in a divaricate manner.
*Divaricato-spinulose*, minutely spiny, the spines spreading in opposite directions.
*Divergent*, spreading outwards from a common centre.
*Divergenti-furcate*, forked, the parts being divergent.
*Ecrustaceous*, destitute of thallus.
*Ecyphellate*, without cyphellæ.
*Effigurate*, having a distinct form or figure.
*Effigurato-dendritic*, in tree-like branchlets or forms.
*Effuse*, spread out in an indeterminate way.
*Efoliolose*, without leaflike scales or squamæ.
*Egranulose*, without granules.
*Electrino-fuscescent*, amber-coloured-brownish.
*Elevated*, raised above a surface.
*Elevato-convex*, convex and uplifted.
*Elevato-sessile*, upraised and sessile.
*Ellipsoid*, approaching the form of an ellipsis.
*Elongate*, lengthened in a longitudinal direction.
*Elongato-acicular*, lengthened needle-shaped.
*Elongato-cylindrical*, like a lengthened cylinder.
*Elongato-fusiform*, lengthened spindle-shape.
*Elongato-granulate*, composed of elongate granules.
*Elongato-laciniate*, with very long laciniæ.
*Elongato-lobate*, having lengthened lobes.
*Elongato-pendulous*, hanging downwards in a lengthened state.
*Elongato-ramose*, with lengthened branches.
*Emergent*, protruded through the cortical layer.
*Emersed*, protruded upwards.
*Emerso-adnate*, protruded upwards and closely pressed to.
*Endocarpoid*, applied to apothecia which are sunk or innate in the substance of the thallus, similar to those in the genus *Endocarpon*.
*Endococcoid*, internal contents becoming red with iodine; or from the minute globular apothecia like those of the genus *Endococcus*, *Nyl.*
*Entire*, as applied to an apothecium in which the perithecium or hypothecium wholly subtends the hymenium, or to the margin of an apothecium which is continuous and unbroken.
*Epiphlœodal*, existing superficially on the epidermis of bark.
*Episporium*, the outer coat of the spores.
*Epithallus*, cortical layer.
*Epithecium*, the expanded coloured disk of the apothecium in most genera, or the terminal pore in the perithecium of the genera *Verrucaria*, *Thelotrema*, and *Astrothelium*.
*Epruinose*, without pruina.
*Eroso-crenate*, crenate as if gnawed.
*Eroso-laciniate*, as it were gnawed into laciniæ.
*Eroso-lacunose*, with lacunæ formed as it were by gnawing.

*Erumpent*, bursting upwards from beneath the cortical layer.
*Erumpenti-innate*, sunken in and bursting forth.
*Evanescent*, deficient or disappearing.
*Even*, smooth.
*Evernioid*, of similar substance and form to the thallus in the genus *Evernia*.
*Excipulum*, receptacle.
*Excluded*, obliterated.
*Expanded*, spread out.
*Explanate*, spread out in the same plane.
*Farinaceous*, chaffy.
*Farinose*, mealy.
*Fasciculate*, collected into small bundles.
*Fasciculato-ramose*, branched in bundles.
*Fastigiate*, rising upwards together to the same plane or level.
*Ferruginous*, rust-colour.
*Ferruginous-red*, rust-coloured-red.
*Fertile*, bearing fructification.
*Fibrillæ*, minute fibre-like branches.
*Fibrillose*, consisting of small fibres.
*Fibrilloso-byssine*, of a fibrous or filamentose nature.
*Fibrilloso-ciliate*, ciliated with minute fibres.
*Fibrilloso-ramulose*, with small slender fibrous-like branches.
*Fibrilloso-ramosule*, with small fibrous branchlets.
*Filamenta ostiolaria*, delicate colourless filaments which line the internal portion of the perithecium of *Verrucaria* immediately around the pore-like epithecium.
*Filamentose*, consisting of thin thread-like filaments or divisions.
*Filiform*, thread-like or filamentous.
*Filiformi-terete*, very slender or thread-like and rounded in a longitudinal direction.
*Fimbriate*, fringed.
*Firm*, almost rigid.
*Fissure*, a crack or ruptured opening,
*Fissured*, split.
*Fistulose*, hollow like a pipe.
*Flabelliformi-lobate*, lobed in a fan-shaped mode.
*Flaccid*, flabby.
*Flavescent*, growing yellow.
*Flavicant*, yellow.
*Flavicanti-sulphureous*, yellowish passing into sulphur-colour.
*Flavido-cinerascent*, yellowish-ashy-grey.
*Flavido-fuscescent*, yellowish-brown.
*Flavido-ochraceous*, ochrey-yellow.
*Flavido-rufescent*, yellowish-red.
*Flavo-albicant*, yellowish-white.
*Flavo-cinerascent*, yellow-ashy-green.
*Flavo-fuscescent*, yellow growing brown.
*Flavo-pallescent*, palish-yellow.
*Flavo-pulverulent*, covered with yellow powder.
*Flavo-sorediate*, with yellow soredia.
*Flavo-virescent*, yellow-green.
*Flavo-viridi-pruinose*, covered with a yellowish-green pruina.
*Flavo-viridi-suffused*, covered with a yellow-green powder.
*Flexuose*, wavy.
*Flocculose*, like wool.
*Flocculoso-pulverulent*, covered with powdery wool-like tufts.
*Foliaceous*, like an expanded leaf or membrane.
*Foliaceo-squamulose*, with leafy squamules.
*Foliicolous*, growing on the leaves of a tree.
*Foliolose*, consisting of minute leaf-like squamæ or scales.
*Foreign*, applied to a lichen growing parasitically on another (or foreign) thallus not its own.
*Fornicate*, arched.
*Foveolate*, having deep pits or depressions.
*Foveolato-immersed*, in sunken pits or small depressions.
*Fragile*, easily broken off.

*Frondose*, foliaceous or in leaf-like expansions.
*Frondoso-dilatate*, dilated foliaceous.
*Fructification*, the apothecium and its contents, viz., asci containing spores and paraphyses.
*Fruticose*, shrub-like.
*Fruticulose*, minutely shrub-like.
*Fruticuloso-erect*, growing erect like a little shrub.
*Fruticuloso-imbricate*, shrub-like, the branches overlapping.
*Fruticuloso-ramose*, branched like a little shrub.
*Fuciformi-branched*, with flattened branches like a fucus or sea-weed.
*Fucoid*, of the nature or similitude of a fucus or sea-weed.
*Fuliginous*, sooty or brown verging on black.
*Fuliginoso-furfuraceous*, having chaff of a dark-smoke-black hue.
*Fuligineo-fuscous*, blackish-brown.
*Fulvescent*, tawny.
*Fulvo-testaceous*, tawny-yellow-brown.
*Furcate*, forked.
*Furcato-divided*, divided in a fork-like way.
*Furcellate*, minutely forked.
*Furfuraceous*, chaffy.
*Furfuraceo-concrescent*, growing together in a scurfy manner.
*Furfuraceo-diffract*, broken up into scurf.
*Furfuraceo-granulose*, like scurfy granules.
*Fuscescent*, tending to become fuscous or brown.
*Fuscous*, of a dark-brown colour.
*Fuscous-black*, dark-brown-black.
*Fusco-cellulose*, consisting of brown cellules.
*Fusco-cinerascent*, brown-greyish.
*Fusco-cinereous*, brown-ashy-grey.
*Fusco-glaucescent*, glaucous dark-brown.
*Fusco-griseous*, brownish-grey
*Fusco-livescent*, brown becoming clouded or paler.
*Fusco-nigrescent*, brown growing black.
*Fusco-nigricant*, brownish-black.
*Fusco-obscurate*, clouded with fuscous colour.
*Fusco-olivaceous*, brown-olive.
*Fusco-pallescent*, brown growing paler.
*Fusco-rufescent*, dark-brownish-red.
*Fusco-rufous*, dark-red-brown.
*Fusco-virescent*, brownish-green.
*Fusiform*, spindle-shaped.
*Fusiformi-bacillar*, fusiform at one end, club-shaped at the other.
*Fusiformi-cylindrical*, a cylindrical form tapering to and more or less pointed at each end.
*Fusiformi-ellipsoid*, broadly fusiform.
*Fusiformi-incrassate*, thickened into a spindle-shape.
*Fusiformi-oblong*, very broadly fusiform.
*Fusiformi-turgid*, swollen into a spindle-shaped form.
*Gelatina hymenea*, a gelatinous substance surrounding the asci and paraphyses, which becomes tinged blue or vinous-red or without reaction on the application of an aqueous solution of iodine.
*Gelatinoso-conglutinate*, glued together by gelatine.
*Gibboso-convex*, unequally tumid or convex.
*Gonidia*, simple spherical cells containing green granular matter, situate immediately under the cortical layer of the thallus.
*Gonidial stratum*, the stratum consisting of gonidia or granula gonima, immediately underneath the cortical layer of the thallus.
*Glabrous*, smooth.
*Glaucescent*, greyish-blue or glaucous-green.
*Glaucous-green*, green like the sea or like a carnation leaf.
*Glauco-albescent*, glaucous growing white.
*Glauco-cærulescent*, glaucous-blue.
*Glauco-cinerascent*, glaucous-ashy-grey.
*Glauco-flavescent*, glaucous-yellow
*Glauco-fuscescent*, glaucous-brown
*Glauco-olivaceous*, of a glaucous-olive colour.

*Glauco-pallescent*, pale-glaucous.
*Glauco-pruinose*, having glaucous pruina.
*Glauco-rufescent*, glaucous-reddish.
*Glauco-virescent*, bluish-green.
*Glebulæ*, crumb-like masses.
*Glebuloso-diffract*, broken up into crumb-like portions.
*Glebuloso-squamose*, having scales of a crumb-like appearance.
*Globose*, round or globular.
*Globoso-lenticular* or *lentiform*, globular lens-shaped.
*Globoso-obovate*, of a roundish obovate form.
*Globoso-ovoid*, of a broad rounded egg-shape.
*Globoso-pulverulent*, a globe covered with powder.
*Globoso-truncate*, a globe depressed above.
*Globoso-turbinate*, of a rounded top-shaped form.
*Globoso-verrucose*, consisting of globose verrucæ or warts.
*Glomerato-deformed*, deformed by being crowded in clusters.
*Glomerules*, clusters.
*Glomeruli*, clusters.
*Glomuliferous*, bearing clusters of minutely branched coral-like excrescences.
*Glomerulose*, minutely clustered.
*Glypholecine*, impressed or canaliculate in an elongate wavy and labyrinthine mode like the genus *Glyphis*.
*Graniform*, like granules.
*Granoso-crenate*, having granular crenations.
*Granula gonima*, clusters of 2, 3, or more sphærical naked (or without outer membrane) cells, filled with green granular matter situate immediately under the cortical layer of the thallus.
*Granulate*, same as *granulose*.
*Granulato-areolate*, applied to a thallus divided into areolæ or spaces of a granular form.
*Granulato-areolato-rimose*, separated by chinks into granular areolæ.
*Granulato-conglomerate*, granular and clustered.
*Granulato-corrugate*, corrugate or roughened with granules.
*Granulato-crenate*, with granular crenations.
*Granuloso-crispate*, crisped and granulose.
*Granulato-crustose*, having a granular crust.
*Granulato-dispersed*, consisting of scattered granules.
*Granulato-furfuraceous*, having granular scurf.
*Granuloso-lobulate*, minute lobes formed of granules.
*Granulato-papillate*, having papillate granules.
*Granulato-plicato-squamulose*, consisting of minute granular plaited squamules.
*Granul ato-pulveraceous*, powdery with minute granules.
*Granulato rugose*, wrinkled with granules.
*Granulato-rugulose*, minutely wrinkled with granules.
*Granulato-scabrous*, rough with granules.
*Granulato-squamulose*, composed of granular squamules.
*Granulato-subareolate*, granular, the granules becoming areolate.
*Granulato-sub-pulverulent*, granular and somewhat powdery.
*Granulato-unequal*, unlevel with granules.
*Granulato-verrucose*, granulate with warts.
*Granulose*, consisting of minute granules.
*Granuloso-concrescent*, granules growing together in a conglomerate manner.
*Granuloso-concrete*, granules closely growing together.
*Granuloso-congested*, having granules heaped together.
*Granuloso-crustaceous*, a crustaceous thallus arranged in granules.
*Granuloso-diffract*, granules broken up into areolæ or clusters.
*Granuloso-leprose*, with granular scurf.
*Granuloso-pulverulent*, powdery with minute granules.
*Granuloso-squamiform*, granules assuming the form of squamæ.
*Granuloso-unequal*, surface made unlevel by granules.
*Granuloso-verrucæform*, wartlike granules.
*Gregarious*, clustered or crowded.
*Griseo-nigricant*, greyish-black.
*Griseo-pallescent*, pale-grey.
*Gyalectiform*, urceolate like a *Gyalecta*.
*Gyalectine*, applied to urceolate apothecia which are of a waxy or marmoreous appearance and consistence as in the old genus *Gyalecta*, now incorporated in *Lecidea*.

*Gyalectoid*, see *Gyalectine*.
*Gymnotremoid*, a naked open spot or space.
*Gyrose*, concentrically twisted or plaited.
*Gyrose*, as applied to the peculiar and complicated flexuosities of the margin of the apothecia in the genus *Umbilicaria*.
*Gyroso-complicate*, plaited in a gyrose way.
*Gyroso-plicate*, plaited in a gyrose manner.
*Hemispherico-conoid*, hemispherical with a conical apex.
*Hemispherico-tuberculose*, consisting of hemispherical minute tubercles.
*Hispido-spinuloso-denticulate*, bristled with very minute spine-like teeth.
*Horizontal*, in contradistinction to erect.
*Horny*, of a horn-like consistence.
*Hyaline*, transparent like glass.
*Hymenium*, the whole internal portion of the apothecium, consisting of paraphyses, asci and spores and gelatina hymenea.
*Hymenicolar*, inhabiting the hymenium.
*Hypophlœodal*, existing beneath the epidermis of bark.
*Hypothallus*, the coloured mycelium-like stratum immediately underneath and upon which the thallus grows.
*Hypothecium*, the internal portion of the apothecium immediately under the hymenium.
*Imbedded*, sunk somewhat in the thallus.
*Imbricate*, overlapping each other.
*Imbricato-congested*, crowded together and overlapping.
*Imbricato-crustaceous*, so closely imbricated as to become crustaceous.
*Imbricato-decumbent*, decumbent and overlapping.
*Imbricato-intricate*, overlapping and entangled.
*Imbricato-lobate*, lobes overlapping each other.
*Imbricato-squamose*, having overlapping scales.
*Immarginate*, applied to apothecia in which the proper margin is obliterated.
*Immersed*, sunk or plunged in the thallus.
*Imperforate*, entire without perforation.
*Implexo-ramose*, branches interwoven.
*Impressed*, pressed into.
*Incano-granuloso-pulverulent*, having a hoary granular powder.
*Incano-tomentellose*, with a hoary down.
*Incavato immersed*, sunk in excavations of the rock.
*Incised*, cut into.
*Inciso-crenate*, having deeply-cut crenations.
*Inciso-crenulate*, deeply cut into minute crenate lobes.
*Inciso-lobate*, with deeply cut lobes.
*Incrassate*, thickened.
*Incrusting*, forming a crust over a thing.
*Incurved*, curved inwards.
*Indeterminate*, unlimited or indefinite.
*Indistinct*, as applied to paraphyses not separated or easily discernible.
*Inflated*, puffed out.
*Inflexed*, bent inwards.
*Infundibuliform*, funnel-shaped.
*Infuscate*, of a brown colour.
*Innate*, sunk or imbedded in the thallus.
*Innato-appressed*, innate and closely pressed to.
*Innato-emergent*, innate and protruded upwards.
*Innato-erumpent*, innate and bursting forth.
*Innato-granulate*, a surface minutely sunken or impressed so as to produce granules.
*Innato-impressed*, pressed and sunken in.
*Innato sessile*, sessile and partially innate.
*Innately-sessile*, partially imbedded.
*Inner tunic*, a membrane more or less coloured which surrounds the nucleus or hymenium in the genus *Verrucaria* situated immediately beneath the perithecium.
*Isidiiferous*, bearing isidiose excrescences.
*Isidiose*, having powdery coral-like excrescences.
*Isidioso-furfuraceous*, covered thickly with chaffy isidia or papillate excrescences.
*Isidioso-scabrous*, roughened with isidiose excrescences.
*Insculpt*, imbedded in the rock.

*Interstitial*, intervening.
*Intricate*, entangled together.
*Intricato-cæspitose*, in entangled tufts.
*Intricato-flexuose*, wavy like a labyrinth.
*Intricato-ramose*, branched in an entangled fashion.
*Iterato-proliferous*, repeatedly proliferous.
*Lacerate*, torn.
*Lacero-dehiscent*, gaping or opening in a torn or lacerate manner.
*Lacero-dissected*, cut in a torn manner.
*Lacero-laciniate*, laciniæ irregularly divided or torn.
*Lacero-lobate*, torn into lobes.
*Lacunæ*, depressions.
*Laciniate*, cut into narrow linear portions.
*Laciniato-effigurate*, arranged in conspicuous laciniæ.
*Laciniato-fibrillose*, consisting of fibre-like laciniæ.
*Laciniato-foliolose*, leaf-like laciniæ.
*Laciniato-lobate*, thallus divided into deeply-cut narrow laciniæ or lobes.
*Laciniato-multifid*, cut into numerous laciniæ.
*Laciniato-ramose*, branched in a laciniate manner.
*Laciniiform*, of the form of laciniæ.
*Laciniolate*, consisting of very minute laciniæ.
*Laciniolæ*, very minute laciniæ.
*Laciniose*, split into laciniæ.
*Lacunose*, having shallow depressions or excavations.
*Lacunoso-canaliculate*, channelled in interrupted depressions.
*Lacunoso-corrugate*, wrinkled and lacunose.
*Lacunoso-impressed*, impressed with sunken depressions.
*Lacunoso-rugose*, wrinkled into lacunæ.
*Læte-virescent*, bright-green.
*Laminæ*, membranous strata.
*Lanceolate*, narrowly elliptical, tapering to each end.
*Lanceolato-linear*, narrowly and parallelly lance-shaped.
*Lateral*, on the side or margin of a thallus or apothecium.
*Lecanorine*, resembling the apothecium of the genus *Lecanora* which has a paler margin composed of or arising from the thallus.
*Lecideiform*, like the apothecium of a *Lecidea*, same as *lecideine*.
*Lecideine*, resembling the apothecium of the genus *Lecidea*, which has a proper margin of the same colour with the disk or epithecium.
*Lenticular*, like a small lens.
*Leprose*, scurf-like.
*Leproso-gelatinous*, scurfy and gelatinous.
*Leproso-granulate*, granules of a scurf-like nature.
*Leproso-granulose*, with scurfy granules.
*Leproso-pulverulent*, having scurfy powder.
*Leproso-tartareous*, scurfy, rough and crumbling.
*Ligulate*, strap-shaped, narrow with the two opposite margins parallel.
*Limitate*, limited or bounded by a distinct line of hypothallus.
*Linear*, narrow, with the two opposite margins parallel.
*Lineari-confluent*, becoming confluent in linear shapes, or running into continuous lines.
*Lineari-dissecto-fimbriate*, cut into a linear fringed margin.
*Lineari-elongate*, an extended linear form.
*Lineari-laciniose*, cut into linear laciniæ.
*Lineari-multipartite*, divided into numerous linear segments.
*Lineari-oblong*, an elongated oblong with the opposite sides nearly parallel.
*Lineari-radiate*, with ray-like linear laciniæ or lobes.
*Lirelloeform*, shaped like a lirella.
*Lirelline*, oblong apothecia elongated into a furrow-like form, simple or branched, sessile or immersed in the thallus, termed a *lirella*, from its shape.
*Livid*, pale and clouded.
*Livido-carneo-fuscescent*, clouded-flesh-coloured growing brown.
*Livido-castaneous*, of a livid-chestnut hue.
*Livido-cinerascent*, of a pale-ashy-grey.
*Livido-fuscescent*, clouded-brownish.
*Livido-fuscous*, of a pale or livid-brown.
*Livido-glaucescent*, of a coloured glaucous hue.
*Livido-nigricant*, clouded-blackish.

*Livido-pruinose*, clouded with pruina.
*Livido-rufous*, clouded-red.
*Livido-testaceous*, clouded-brownish-yellow.
*Livido-virescent*, clouded-green.
*Lobate*, consisting of many lobes or divisions, in contradistinction to *simple*.
*Lobato-crenate*, having crenate lobes.
*Lobato-deformed*, having deformed lobes.
*Lobato-dilated*, with broad expanded lobes.
*Lobato-divided*, divided into lobes.
*Lobato-incised*, deeply cut into lobes.
*Lobato-laciniate*, lobed in a laciniate manner.
*Lobato-partite*, parted into lobes.
*Lobe*, a division of the thallus, various in size and shape.
*Lobed*, consisting of many lobes or divisions.
*Lobulæ*, very minute lobes.
*Lobulato-granulose*, minute granular lobes.
*Longitudinal*, parallel to the longer axis of a figure.
*Lurid*, dull.
*Lurido-cinerascent*, dull-ashy-grey.
*Lurido-olivaceous*, a dull-olive-hue.
*Lurido-rufescent*, dull-reddish.
*Luteo-fulvous*, yellow-tawny.
*Luteo-fuscescent*, of a yellow-brownish colour.
*Luteo-ochraceous*, yellow-ochrey colour.
*Luteo-rufescent*, yellow-reddish.
*Luteo-virescent*, yellow-greenish.
*Lutescenti-fuscescent*, yellowish-brown.
*Lutescenti-ochraceous*, of a yellowish-ochrey colour.
*Lycoperdoid*, like a tubercular fungus called Lycoperdon.
*Macrophylline*, consisting of elongated extended leaflets.
*Macular*, spot-like or patchy.
*Maculari-determinate*, a limited or defined spot or patch.
*Magmoid*, like an alga, consisting of spherical green cellules.
*Marginal*, situate on a margin or edge.
*Marginate*, having a margin.
*Margined*, an apothecium surrounded with a distinct border or elevated margin.
*Mastoid*, teat-like.
*Mastoideo-prominent*, in teat-like prominences.
*Medio-depressed*, depressed or sunken in the centre.
*Medio-perforate*, perforated in the centre.
*Medullary axis*, the same as medullary layer, the innermost stratum of the thallus.
*Membranaceous*, thin, and spread out like a membrane in contradistinction to crustaceous.
*Membranaceo-corticate*, having a cortical layer thin like a membrane.
*Membranaceo-dilatate*, a membranaceous thallus, horizontally dilated or spread out.
*Membranaceo-laciniose*, a membrane cut into laciniæ.
*Membranaceo-lobate*, lobes of a thin membrane-like texture.
*Membranaceo-papyraceous*, of a membrane-like consistence like paper.
*Microlepideo-granulose*, composed of minute scaly granules.
*Microphylline*, composed of minute leaflets or scales.
*Miniato-fulvescent*, vermilion colour growing tawny.
*Moderate*, of a size intermediate between large and small.
*Moniliform*, spherical granules arranged together in a necklace-like form.
*Monophyllous*, of one leaf or membrane.
*Monophyllo-lobate*, a lobed one-leafed thallus.
*Mucoso-gelatinous*, of a gelatinous mucous consistence.
*Mucronate*, with a mucro or point.
*Multifid*, cut into many laciniæ.
*Multifido-laciniate*, cut into many laciniæ.
*Multi-laciniate*, divided into many laciniæ.
*Multilocular*, many-celled.
*Multi-nucleolate*, having many nuclei.
*Multiseptate*, as applied to spores having numerous septa or divisions.
*Murali-divided*, spores whose internal contents are arranged or divided like the masonry of a stone wall.

*Murali-locular*, see *murali-divided*.
*Murali-reticulate*, marked with muriform reticulations.
*Muriformi-locular*, same as *murali-locular*.
*Naked*, without covering or mark.
*Nerveless*, destitute of nerves.
*Nigrescent*, approaching a black colour.
*Nigrescenti-olivaceo-virescent*, blackish-olive-green.
*Nigricant*, black.
*Nigricanti-cœrulescent*, of a blackish-blue colour.
*Nigricanti-cinereous*, blackish-ashy-grey.
*Nigricanti-clavate*, black club-shaped.
*Nigricanti-fibrillose*, with blackish fibres.
*Nigricanti-furfuraceous*, covered with a blackish scurf.
*Nigricanti-limitate*, thallus defined or limited by a blackish line of hypothallus.
*Nigricanti-macular*, forming a black spot or patch.
*Nigro-cæsious*, blackish-blue-grey.
*Nigro-ciliate*, with black ciliæ or hairs.
*Nigro-determinate*, defined by a black line of hypothallus.
*Nigro-fibrillose*, with black fibres.
*Nigro-fibrilloso-ciliate*, ciliated with black fibres.
*Nigro-fuscescent*, black-brown.
*Nigro-fuscous*, of a dark or blackish-brown colour.
*Nigro-marginate*, having black margins.
*Nigro-olivaceous*, black-olive.
*Nigro-piceous*, pitch-black.
*Nigro-rhizinose*, having black rhizinæ.
*Nigro-rufous*, black-red.
*Nigro-tomentose*, having black tomentum.
*Nigro-virescent*, black or dark-green.
*Nodules*, knot-like bodies.
*Noduliform*, like a knot.
*Noduloso-confluent*, knot-like tubercles flowing together or conjoined.
*Noduloso-pulvinate*, in knot-like cushiony patches.
*Normal*, of the ordinary structure or form or size.
*Nucleus*, an internal knot-like substance or contents.
*Nucleiform*, a knot-like tubercle containing a nucleus.
*Nucleolate*, having nuclei.
*Obconico-turbinate*, inversely conical and topshaped.
*Oblique*, slanting.
*Obliterated*, evanescent.
*Obliterato-squamulose*, having scales somewhat obliterated or changed.
*Oblong*, elliptical, obtuse at each end.
*Oblongo-cylindrical*, a wide cylindrical form.
*Oblongo-ellipsoid*, broadly and obtusely elliptical.
*Oblongo-fusiform*, broadly fusiform.
*Oblongo-lobate*, in oblong lobes.
*Oblongo-ovoid*, shape between oblong and eggshape.
*Obovate*, reversely ovate, the broad end uppermost.
*Obscurate*, darkened.
*Obscured*, darkened.
*Obsolete*, evanescent.
*Obtuse*, not pointed, with a rounded or blunt termination.
*Ocellate*, imbedded in and margined like a little eye.
*Ochraceo-ferruginous*, of an ochrey-rust-colour.
*Ochraceo-granuloso-pruinose*, with an ochrey granular pruina.
*Ochraceo-lutescent*, ochrey-yellow.
*Ochroleuco-pulverulent*, with white or pale-ochrey powder.
*Ochraceo-suffused*, covered with ochrey pruina.
*Ochroleucous*, pale-ochrey-colour.
*Oleoso-locular*, spores with cells like drops of oil.
*Olivaceo-cervine*, olive-tawny.
*Olivaceo-cinereous*, of an olive-ashy-grey.
*Olivaceo-fuscescent*, olive-brownish.
*Olivaceo-fuscous*, dark-olive-brown.
*Olivaceo-virescent*, olive-green.
*Opake*, dull, not polished or shining.

*Orbicular*, of an expanded circular form.
*Orbiculari-radiose*, passing from an orbicular form into a radiate one.
*Orbiculari-squamose*, squamæ spreading in an orbicular space.
*Orbiculate*, same as *orbicular*.
*Ostiolum*, the portion of the perithecium of a *Verrucaria*, or that portion of the thalline verruca in *Pertusaria*, protruded above the surface of the thallus.
*Oval*, broadly elliptical obtuse at each end.
*Oviformi-oblong*, an oblong slightly broader at one end and so approaching to the shape of an egg.
*Ovato-oblong*, oblong broader at one end.
*Ovato-subpyriform*, an ovate form verging towards a pear-shape.
*Ovoid*, shaped like an egg.
*Ovoideo-ellipsoid*, an ellipsis somewhat broader at one end.
*Pallescent*, growing pale.
*Pallescenti-livid*, pale-clouded.
*Pallido-albicant*, pale or whitish.
*Pallido-canescent*, pale-hoary.
*Pallido-castaneous*, pale-chestnut-brown.
*Pallido-cervine*, pale-tawny.
*Pallido-cinerascent*, pale-ashy-grey.
*Pallido-cinereous*, pale-ashy-grey.
*Pallido-cinereo-rufescent*, pale-ashy-reddish.
*Pallido-fuscescent*, pale-brown.
*Pallido-fusco-cinerascent*, pale-brown-ashy-grey.
*Pallido-glaucescent*, pale-glaucous.
*Pallido-livid*, pale-clouded.
*Pallido-lutescent*, palish-yellow.
*Pallido-ochraceous*, pale-ochrey.
*Pallido-rufescent*, pale-red.
*Pallido-rufous*, pale-red.
*Pallido-spadiceous*, pale-light-brown.
*Pallido-sulphureous*, pale-sulphur-coloured.
*Pallido-sulphureo-virescent*, pale-sulphury-green.
*Pallido-testaceous*, pale-brownish-yellow.
*Pallido-virescent*, pale-greenish.
*Palmatifid*, cut or divided in a palmate manner.
*Palmato-multifid*, cut into many laciniæ resembling the human hand.
*Papillæ*, small nipple-like projections.
*Papillæform*, like small nipple-like prominences.
*Papillato-dactyloid*, in finger-shaped papillæ.
*Papillato-exasperate*, roughened with minute papillæ or points.
*Papillato-sorediate*, with sorediate papillæ.
*Papillato-unequal*, uneven with papillæ.
*Papillato-verrucose*, consisting of papillate warts.
*Papilloso-granulate*, having granular papillæ.
*Papilloso-scabrous*, roughened with minute nipple-like prominences.
*Papilloso-subglobose*, of a somewhat globular papillate aspect.
*Parallel*, lines maintaining an equal distance from each other.
*Paraphyses*, minute hyaline thread-like filaments accompanying the asci, having rounded or clavate coloured apices which by their juxta-position give the peculiar colour to the epithecium.
*Parasitic*, growing on some other lichen.
*Paries*, wall.
*Patellaroid*, like a little dish.
*Patelliform*, dish-shaped.
*Patellulate*, like a little dish.
*Pauci-articulate*, with few joints.
*Plano-convex*, of flattened convexity.
*Pedato-radiate*, radiate like the foot of a bird.
*Pedicillate*, stalked.
*Pellucid*, transparent.
*Peltate*, placed like a pelta or shield horizontally on the apex of a division of the thallus or on a stipes.
*Peltiform*, shield-like.
*Pendulous*, hanging downwards.
*Perforated*, having round holes,

*Peridium*, a membrane covering several hymenia.
*Perithecium*, the outer case, either entire or dimidiate, enclosing the hymenium as in *Verrucaria*.
*Persistent*, permanent or not falling off.
*Piloso-ciliate*, fringed or ciliated with hairs.
*Pinnatifido-dissected*, cut in a pinnatifid mode.
*Pinnatifido-divaricate*, divided into lateral segments which spread out in a divaricate manner.
*Plane*, flattened.
*Plano-appressed*, flattened and closely pressed to a thing.
*Plano-canaliculate*, a plane surface channelled.
*Plano-compressed*, laterally pressed into a flat surface.
*Plano-depressed*, pressed downwards and flat on the upper surface.
*Platyphyllous*, broad-leaved.
*Plicate*, plaited.
*Plicato-deformed*, deformed by being plaited.
*Plicato-laciniate*, laciniæ arranged in a plaited manner.
*Plicato-rugose*, wrinkled in a plaited manner.
*Plicato-undulate*, plaited and wavy.
*Plicato-verrucoso-granulose*, having plaited warty granules.
*Plicatulate*, minutely plaited.
*Pliciform*, plait-like.
*Plumbeo-albicant*, lead-colour becoming whitish.
*Plumbeo-cœrulescent*, leaden-blue.
*Plumbeo-cinerascent*, leaden-ashy-grey.
*Plumbeo-fuscescent*, of a brownish-lead-colour.
*Plumbeo-glaucescent*, of a glaucous-lead-colour.
*Plumbeo-virescent*, of a lead-coloured-green.
*Pluri-articulate*, with many articulations or joints.
*Plurilocular*, many-celled.
*Pluriseptate*, having many septa.
*Podetiiform*, resembling a podetium.
*Podetiiformi-stipitate*, having a stipes like a podetium.
*Podetium*, the stem-like portion of the thallus in the genus *Cladonia*, which bears on its apex the apothecium.
*Podicellate*, stalked.
*Polari-bilocular*, a spore with the cells placed at the opposite apices.
*Polari-nucleolate*, having nuclei in the opposite apices of a spore.
*Polygonal*, of many angles.
*Polymorphous*, of many forms.
*Polyphyllous*, many-leaved.
*Polysporous*, having asci containing numerous spores or more than the usual number of 8.
*Poriform*, like a pore.
*Predominant*, very conspicuous and in excess.
*Proliferous*, bearing marginal buds or lobes.
*Proliferously-denticulate*, the marginal teeth becoming proliferous.
*Prominent*, projecting or elevated.
*Proper margin*, the margin of the apothecium formed from the apothecium itself and not from the thallus.
*Prostrate*, lying flat on a surface.
*Protoplasm*, elementary matter.
*Protruded*, thrust out or forwards.
*Pseudo-biatorine*, falsely biatorine, or having an apothecium without a conspicuous thalline margin, but at the same time without any observable proper margin or convex and immarginate.
*Pseudo-cyphellæ*, minute excavations on the under surface of the thallus filled with white or yellow powder.
*Pseudo-cyphellate*, having false or imperfect cyphellæ.
*Pseudo-disciform*, falsely disk-like.
*Pseudo-scutelliform*, falsely shield-like.
*Pseudo-thallodal*, apparently formed of the thallus.
*Puberulo-villose*, with pubescent hairs.
*Pulpy*, formed of pulp, springy and elastic.
*Pulveraceous*, powdery.
*Pulvereous*, powdery.
*Pulvereo-granulose*, with powdery granules.

*Pulverulent*, powdery.
*Pulverulento-furfuraceous*, powdery and scurfy.
*Pulverulento-granulose-furfuraceous*, powdery, granulose, and chalky or scurfy.
*Pulvinate*, cushion-like.
*Pulvinati*, cushion-like masses or conurbations.
*Pulvinato-congloomerate*, in cushion-like clusters.
*Punctato-scabrid*, rough with minute elevated points.
*Punctiforato-impressed*, with minute sunken or impressed points or dots.
*Punctiform*, like dots or points.
*Punctiformi-contracted*, contracted into a mere point or dot.
*Punctiformi-impressed*, impressed like minute points or dots.
*Pycnocarpous*, having fructification like that of a *Verrucaria*.
*Pycnodiscus*, wart-like.
*Pycnodisc*, globular and nuclear.
*Pyriform*, pear-shaped.
*Radiate*, spreading outwards on all sides from a centre.
*Radiato-congregate*, in radiate clusters.
*Radiato-coronate*, with a ray-like corona or margin of minute lobes.
*Radiato-crenulate*, with radiating crenulations.
*Radiato-cristate*, with crest-like projections spreading in a radiate way.
*Radiato-cymose*, a cyme spreading ray-like.
*Radiato-fimbriate*, radiately fringed.
*Radiato-fissured*, fissured in a radiate manner.
*Radiato-incised*, deeply cut and radiate.
*Radiato-lobate*, lobed, the lobes spreading in a ray-like way.
*Radiato-plicato-lobate*, lobes spreading in a plaited ray-like fashion.
*Radiato-plicato-rugose*, radiate, plaited and wrinkled.
*Radiato-rimose*, having chinks spreading outwards in a radiate manner.
*Radiato-rugose*, wrinkled in a radiate direction.
*Radiato-rugoso-plicatulate*, wrinkled and plaited in a radiated direction.
*Radiato-sulcate*, furrowed in rays.
*Radioso-fimbriate*, having a radiate fringe.
*Radioso-laciniate*, the separate laciniæ of a thallus spreading in a ray-like mode.
*Radioso-rimose*, with ray-like chinks.
*Ramose*, branched.
*Ramoso-divided*, branched in many divisions.
*Ramoso-fimbriate*, branched in a fringed manner.
*Ramoso-incised*, branched and incised.
*Ramuli*, branchlets or secondary branches.
*Ramulose*, with secondary branches.
*Ramuloso-ciliate*, fringed with branching ciliæ.
*Ramuloso-spinulose*, having minute spine-like branches.
*Receptacles*, the portions of the thallus in which the apothecia are imbedded or inclosed.
*Recurved*, curved backwards.
*Reniform*, kidney-shaped.
*Repando-crenate*, sinuously crenate.
*Repando-lobulate*, with repand or sinuous lobes.
*Reticulate*, like network.
*Reticulato-foveolate*, having deep depressions separated by raised reticulations or network.
*Reticulato-lacunose*, depressions separated by network or elevated reticulations.
*Reticulato-nigricanti-nervose*, reticulated with blackish nerves.
*Reticulato-rimulose*, having very minute rimæ or chinks arranged in a reticulate manner.
*Reticulato-rugose*, wrinkled in a net-like manner.
*Reticulato-rugulose*, minutely wrinkled with elevated reticulations.
*Reticulato-sorediate*, having sorediate elevated reticulations.
*Reticulato-tomentose*, having downy reticulations.
*Retuse*, having the centre depressed.
*Retuso-truncate*, cut off abruptly and having the centre depressed.
*Rhagadioso-diffract*, broken up in a deeply cleft mode.
*Rhizinæ*, root-like filaments.
*Rhizinose*, having rhizinæ or root-like filaments on the under surface of the thallus.

*Rigescent*, approaching a rigid or stiff consistence.
*Rigid*, stiff.
*Rimiform*, having a longitudinal chink or furrow.
*Rimiformi-angustate*, having a narrow chink or furrow
*Rimiformi-constricted*, having a contracted chink or furrow.
*Rimoso-areolate*, divided into areolæ by chinks.
*Rimoso-diffract*, broken into areolæ by widish chinks.
*Rimoso-insculpted*, having rimæ or chinks sculptured out or cut out of a surface.
*Rimoso-squamulose*, with squamules separated by chinks.
*Rimulose*, broken by minute rimæ or chinks.
*Rimuloso-dehiscent*, ruptured in an irregular radiate chinky manner.
*Rotundate*, rounded.
*Rotundato-difformed*, of a deformed round shape.
*Rotundato-lobate*, with round lobes.
*Rotundato-pulvinular*, in round cushion-like masses.
*Rotundato-undulato-crenate*, rounded, wavy and crenate.
*Rotundo-abbreviato-laciniate*, cut into short rounded laciniæ.
*Rotundo-crenate*, rounded and crenate.
*Rotundo-dilated*, rounded and spread out.
*Rotundo-obovate*, of a roundish obovate form.
*Rotundo-poriform*, with a round pore.
*Rotundo-squamulose*, with minute rounded squamules.
*Roseo-carneous*, of a rosy-flesh-colour.
*Rosulate*, rose-like.
*Rosulato-lobulate*, minutely lobed and spreading in a rose-like or stellate manner.
*Rubiginose*, of a reddish-hue.
*Rubricoso-fuscescent*, of a brick-red-dark-brown.
*Rubricoso-fuscous*, reddish-dark-brown.
*Rubricoso-nigricant*, of a brick-red-black colour.
*Rubricoso-rufescent*, of a brick-red-reddish-brown.
*Rufo-badious*, reddish-dull-brown.
*Rufo-fuscescent*, reddish-brown.
*Rufo-testaceous*, red-yellow-brown.
*Rufous*, full-red-brown.
*Rufescent*, reddish-brown.
*Rufescenti-cinerascent*, reddish-ashy-grey.
*Rugose*, wrinkled.
*Rugoso-convex*, wrinkled and convex.
*Rugoso-crenate*, wrinkled into crenations.
*Rugoso-crenulate*, with wrinkled minute crenations.
*Rugoso-granulate*, wrinkled and granular.
*Rugoso nodulose*, wrinkled and knotty.
*Rugoso-plicate*, wrinkled and plaited.
*Rugoso-pustulate*, wrinkled and pustuled.
*Rugoso-subrimose*, wrinkled and somewhat chinky.
*Rugoso-unequal*, with an uneven wrinkled surface.
*Rugulose*, slightly wrinkled.
*Ruguloso-areolate*, with wrinkled areolæ.
*Sanguineo-black*, blood-red-black.
*Scabrid*, scabrous or rough.
*Scabrous*, rough with minute elevations.
*Scattered*, dispersed.
*Scobiformi-granulate*, granules like fine saw-dust.
*Scrobiculate*, having numerous small shallow depressions or excavations.
*Scurfy*, peeling off in small detached flakes.
*Scutelliform*, shield-like.
*Scyphi*, open cups.
*Scyphiform*, cup-like.
*Scyphiphorous*, bearing scyphi.
*Scyphose*, bearing thalline cups as in *Cladonia*.
*Segregate*, separate.
*Semi-immersed*, partially immersed.
*Septate*, having divisions.
*Septato-articulate*, jointed and septate.
*Septato-murali-divided*, septate and with muriform cellules.
*Septulæ*, minute septa.
*Septum*, the partition dividing the spores internally into two or more portions.

*Sessile*, without any stipes or stalk.
*Setuliform*, thread-like.
*Simple*, as applied to spores having no septum or division.
*Sinuate*, margin uneven with alternate concavities and convexities.
*Sinuato-incised*, deeply cut into in a sinuate or wavy manner.
*Sinuato-flexuose*, sinuate and wavy.
*Sinuato-laciniate*, cut into sinuate laciniæ.
*Sinuato-lobate*, lobed in a sinuate manner.
*Sinuato-multifid*, divided into many sinuate laciniæ.
*Sinuato-pinnatifid*, deeply cut into lateral segments which have sinuate margins
*Sinus*, the concavity in a sinuate lobe or lacinia.
*Solæform*, slipper-shaped.
*Soredia*, heaps of powdery granules.
*Sorediato-lacerate*, torn and sorediate.
*Sorediato-tuberculose*, having tubercles more or less sorediate.
*Sorediiferous*, bearing soredia.
*Spadiceous*, bright-clear-brown.
*Spadiceo-fuscous*, bright-dark-brown.
*Spadiceo-pallescent*, a bright-brown growing paler.
*Spadiceo-rufescent*, reddish-brown.
*Spadiceo-rufous*, bright-brownish-red.
*Sphærical*, globose.
*Sphæroideo-cellulose*, formed of globular cellules.
*Spermatia*, minute cylindrical or rod-shaped bodies contained in the spermogonia and conjectured to be the male fertilizing organs.
*Spermogonia*, minute tubercles of the thallus various in colour, and conjectured to contain the male organs of fertilization.
*Spermogoniferous*, bearing spermogonia.
*Spinose*, spiny.
*Spinulose*, having minute spines.
*Spinuloso-ciliated*, fringed with minute spine-like ciliæ.
*Spongioso-tomentose*, spongy and downy.
*Spores*, bodies various in shape and size, either simple or septate or locular contained in the asci.
*Spreading*, expanding.
*Spurious*, apparently but not really.
*Squamæform*, scale-like.
*Squamigerous*, bearing squamæ or scales.
*Squamose*, consisting of scale-like leaflets or squamæ.
*Squamoso-decorticate*, the cortical layer peeling off in scales.
*Squamoso-foliolose*, leaf-like squamæ.
*Squamoso-lobate*, with lobe-like squamæ.
*Squama*, a leaf-like scale.
*Squamaceous*, scaly.
*Squamulæ*, very minute scales or squamæ.
*Squamulose*, consisting of very minute leaflike scales or squamæ.
*Squamuloso-areolate*, with areolate minute scales.
*Squamuloso-crenate*, having minute crenate scales.
*Squamuloso-effigurate*, fashioned into scales.
*Squamuloso-glebulose*, consisting of small scaly crumb-like masses.
*Squamuloso-granulate*, consisting of granular squamules.
*Squamoso-imbricate*, with overlapping squamæ.
*Stellato-appressed*, closely pressed in a stellate manner.
*Stellato-congregate*, clustered in a stellate arrangement.
*Stellato-dehiscent*, dehiscing in a stellate manner.
*Stellato-divided*, divided in a stellate or star-like form.
*Stellato-laciniate*, laciniæ spreading in a stellate manner.
*Stellato-orbicular*, as applied to a thallus whose laciniæ or lobes radiate from a centre in a star-like manner within a rounded space.
*Stellato-radiate*, radiating in a star-like form.
*Stenophyllous*, narrow-leaved.
*Sterigmata*, minute filaments either simple or articulate, within the spermogonia, which bear the spermatia.
*Stipate*, crowded.
*Stipes*, a stalk or elevated support.
*Stipitate*, having a stipes or stalk.
*Stramineous*, straw-coloured.

*Stratum-gonidiale*, the layer immediately beneath the cortical layer containing the gonidia.
*Striated*, marked by longitudinal lines or furrows.
*Striato-crenulate*, striated and crenulate.
*Striato-nervous*, striated with prominent nerves.
*Striato-rugose*, wrinkled with striæ.
*Stuppeous*, woolly.
*Subæruginose*, somewhat of a verdigris-green.
*Subampullæform*, somewhat flask-like shape.
*Subangulose*, somewhat angular.
*Subareolate*, nearly areolate.
*Subbiatorine*, nearly biatorine.
*Subbyssoid*, of a somewhat byssoid or fibrous nature.
*Subcarinate*, somewhat keel-shaped.
*Subciliate*, somewhat ciliate.
*Subclavato-fusiform*, of a somewhat club-shaped spindle-shape.
*Subcolliculoso-areolate*, having areolæ of somewhat hilly projections.
*Subcompressed*, slightly compressed.
*Subconcentric*, arranged in a somewhat concentric manner.
*Subconcolorous*, nearly of the same colour.
*Subconglomerate*, somewhat clustered.
*Subconglutinate*, somewhat glued together.
*Subcontinuous*, having a nearly unbroken surface.
*Subcoriaceous*, somewhat leathery.
*Subcortical*, beneath the cortical layer.
*Subcostate*, somewhat ribbed.
*Subcorymbose*, with the lower branches elevated to nearly the same level as the upper ones like a corymb.
*Subcrenulate*, somewhat crenulate.
*Subcrustaceo-leproso-granulate*, somewhat crustaceous, leprous and granular.
*Subcylindrical*, nearly cylindrical.
*Subcymbiform*, somewhat of a boat-shape.
*Subcymoso-proliferous*, proliferous from the centre like a cyme.
*Subdecorticate*, nearly destitute of the cortical layer.
*Subdeterminate*, somewhat limited or defined.
*Subdiffract*, somewhat broken up into areolæ.
*Subdisciform*, somewhat of a disk-like appearance.
*Subeffigurate*, somewhat of a defined form.
*Subeffuso-areolate*, having areolæ scattered or dispersed in an indefinite manner.
*Subfarinaceous*, somewhat chaff-like.
*Subfastigiate*, approaching the same level.
*Subfastigiato-fruticulose*, like a little shrub whose branches all rise to nearly the same level.
*Subfibrillose*, somewhat minutely fibrous.
*Subfilamentose*, somewhat filamentose.
*Subfimbriate*, somewhat fringed.
*Subfoliaceous*, becoming leafy.
*Subfusiform*, nearly fusiform.
*Subgelatinous*, somewhat gelatinous.
*Subglobose*, almost globose.
*Subgloboso-deformed*, globose bodies deformed by close contact or crowding.
*Subgloboso-incrassate*, thickened into a somewhat globose form.
*Subgloboso-tuberculiform*, like globular tubercles.
*Subgranulato-unequal*, approaching an uneven somewhat granulose surface.
*Subgranulose*, nearly granulose.
*Subgranuloso-rugose*, somewhat wrinkled with granules.
*Subgyrose*, somewhat gyrose.
*Subgyroso-verrucose*, having somewhat whirled verrucæ or warts.
*Subhymeniale*, under the hymenium.
*Subimbricate*, nearly overlapping each other.
*Subimmersed*, somewhat immersed.
*Subincumbent*, somewhat bending downwards.
*Subinnato-sessile*, superficial but somewhat immersed in the thallus.
*Sublacunose*, somewhat lacunose.
*Sublævigate*, somewhat smoothed.
*Sublecanorine*, nearly lecanorine.
*Sublecideine*, apothecia nearly like those of the genus *Lecidea*.

*Subleprose*, somewhat scurfy.
*Subtimitate*, somewhat limited or with a definite boundary.
*Sublobato-plicate*, somewhat lobed and plaited.
*Sublobulate*, somewhat lobed.
*Sublobulato-concrescent*, growing together in minute lobes.
*Submembranaceous*, almost membranaceous.
*Submonophyllus*, almost formed of one leaf.
*Submurali-divided*, nearly murali-divided.
*Suborbiculari-determinate*, having a limited or defined somewhat orbicular form.
*Suborbiculari-stellate*, radiating in a somewhat orbicular space.
*Subpalmato-nervose*, having nerves spreading in a palmate manner.
*Subpeltate*, somewhat peltate.
*Subplicato-contiguous*, lying close together in somewhat plaited manner.
*Subpodicellate*, somewhat stalked or stipitate.
*Subpyrenoid*, nearly like a *Verrucaria*.
*Subpyrenodeo-lecanorine*, an apothecium nearly like the fructification of a *Verrucaria* but surrounded with a thalline margin.
*Subradiate*, approaching a radiate shape.
*Subradiato-lobate*, consisting of somewhat ray-like lobes.
*Subramoso-papillato-granulate*, with branched papillate granules.
*Subrubricoso-fuscous*, somewhat brick-red-brown.
*Subrugose*, somewhat wrinkled.
*Subrugulose*, somewhat minutely wrinkled.
*Subsecund*, somewhat turned towards one side.
*Subsessile*, nearly or almost sessile.
*Subspadiceous*, of a somewhat bright-brown.
*Subsphærical*, nearly sphærical.
*Subspongiose*, nearly spongy.
*Subsquamose*, somewhat scaly.
*Subsquamaceo-granulose*, granules becoming nearly like squamæ,
*Subsquamoso-plicato-verruculose*, with plaited warty scales.
*Subsquamulose*, almost squamulose.
*Subsquamuloso-concrescent*, growing together in a somewhat scaly manner.
*Subsquamuloso-granulate*, the granules merging into scales.
*Substellato-deformed*, deformed in a somewhat stellate manner.
*Substellato-radiate*, nearly stellato-radiate.
*Substipitate*, with a slight stipes or stalk.
*Substraminoous*, somewhat straw-coloured.
*Subtartareous*, nearly tartareous.
*Subtomentose*, somewhat tomentose or downy.
*Subulate*, awl-shaped.
*Subulato-spinose*, with awl-shaped spines.
*Subuliform*, awl-shaped.
*Suburceolate*, somewhat urceolate.
*Subventricoso-cornute*, having a swollen horn-shaped form.
*Subverrucose*, somewhat warty.
*Subverrucoso-tomentose*, somewhat warty and downy.
*Subvirescenti-suffused*, covered with a greenish hue or pruina.
*Sulciform*, furrowed or channelled.
*Sulphureous*, sulphur or brimstone-coloured.
*Sulphureo-pulverulent*, covered with sulphury powder.
*Sulphureo-sorediate*, with sulphur-coloured soredia.
*Sulphureo-suffused*, coloured with sulphury powder or pruina.
*Sulphureo-virescent*, sulphury-green.
*Superficial*, lying on the surface.
*Tartareous*, having a rough crumbling surface.
*Tartareo-farinose*, with crumbly powder.
*Terete*, longitudinally rounded.
*Tereti-compressed*, terete and compressed.
*Teretiusculo-compressed*, somewhat terete or compressed.
*Terminal*, on the apex or summit of a branch or stipes.
*Terricole*, growing on the earth.
*Tessellato-areolate*, having areolæ resembling a tesselated pavement.
*Testaceo-fuscescent*, yellowish-brown passing into dark-brown.
*Testaceo-rufescent*, yellowish-brown passing into reddish-brown.
*Testaceo-rufous*, brownish-yellow-red.
*Thalamium*, the same as hymenium.

*Thalline*, composed of, or of the same substance as the thallus.
*Thalline-margin*, the margin of an apothecium formed of the thallus.
*Thallodal*, composed of the thallus.
*Thallus*, the foliaceous or crustaceous portion of a lichen which bears the fructification.
*Thecæ*, see *Asci*.
*Theciferous*, bearing thecæ or asci.
*Thelotremoid*, having tubercular apothecia like those of *Thelotrema*.
*Thelotremoideo-lecideine*, having an open wart-like or disk-like aspect.
*Thyrsoid*, like a thyrsus, the branches compact, the lower ones shorter than the middle ones.
*Thyrsoideo-conglomerate*, clustered together in a thyrsus-like manner.
*Tomentose*, covered with tomentum or down-like hairs.
*Tomentoso-filamentose*, tomentum composed of filaments.
*Torto-curvate*, curved and twisted.
*Toruloso-intricate*, knotted and entangled.
*Transverse*, at right angles to the longitudinal direction.
*Tremulous*, shaky.
*Tripartite*, divided into three portions.
*Triquetrous*, three-edged or sided.
*Triseptate*, having 3-septa or divisions.
*Truncate*, with an abrupt termination as if cut off.
*Truncato-conical*, of a truncate or flattened cone-shape.
*Truncato-crenate*, abruptly cut off and crenate.
*Truncato-furcate*, truncate and forked.
*Tuberculate*, consisting of tubercles.
*Tuberculose*, covered with little excresences or warts.
*Tuberculoso-albo-sorediate*, having white sorediate tubercles.
*Tuberculoso-elevated*, raised upon a tubercle.
*Tuberculoso-glomerate*, in clustered tubercles and conglomerations.
*Tuberculoso-lecanorine*, a lecanorine apothecium elevated on a tubercle.
*Tuberculoso-nigricanti-sorediate*, having blackish sorediate tubercles.
*Tuberculoso-sphærical*, consisting of round tubercles.
*Tuberculoso-unequal*, uneven with tubercles.
*Tubulose*, hollow like a tube.
*Tubuloso-inflated*, having an inflated tube-like form.
*Tumid*, swollen.
*Turbinate*, shaped like a top.
*Turbinato-cylindrical*, of an elongated top-like form.
*Turbinato-lentiform*, top-shaped, flattened on the summit.
*Turgescent*, swollen.
*Turgid*, swollen.
*Turgido-cylindrical*, of a swollen cylindrical shape.
*Umber*, dull-brown.
*Umbilically*, as applied to a thallus fixed to the matrix by the centre; as applied to an epithecium, navel-like.
*Umbonate*, with a projecting point or boss in the centre.
*Umbrino-olivaceous*, umber-coloured-olive.
*Undulate*, wavy.
*Undulato-attenuate*, tapering upwards in a wavy mode.
*Undulato-crispate*, wavy and crisped or curled.
*Undulato-crisped*, wavy and crisped.
*Undulato-lobate*, with wavy lobes.
*Undulato-plane*, a flattened wavy surface.
*Undulato-plicate*, wavy and plaited.
*Undulato-rugose*, wrinkled in a wavy mode.
*Undulato-sinuate*, waved in a sinuate mode.
*Undulato-sulcato-rugose*, with wavy furrowed wrinkles.
*Uniform*, of the same size, thickness or substance throughout.
*Uniseptate*, spores with one septum or division.
*Unstratified*, applied to a thallus in which the normal layers cannot be distinctly seen but are confused.
*Urceolate*, of a sunken cup-like shape.
*Urceolariform*, sunk in the thallus like a cup as the apothecia of the genus *Urceolaria*.
*Urceolato-appressed*, having an urceolate apothecium closely pressed to the thallus.

*Urceolato-concave*, concave like a cup.
*Urceolato-innate*, applied to apothecia of a cup-like shape sunken in the thallus.
*Urceolato-scutelliform*, urceolate and shield-like.
*Variolarioid*, an abortive apothecium developed into a powdery or granulose tubercle, like the supposed fructification of the old pseudo-genus *Variolaria*.
*Villose*, hairy.
*Vinous-red*, red like port wine.
*Violaceo-fuscescent*, violet with a brown hue.
*Violaceo-rubescent*, violet with a red tinge.
*Virescent*, approaching a green hue.
*Virescenti-cinerascent*, greenish-ashy-greyish.
*Virescenti-cinereous*, greenish-ashy-grey.
*Virescenti-fuscescent*, greenish-brown.
*Virescenti-fuscous*, greenish-dark-brown.
*Virescenti-olivaceous*, greenish-olive.
*Viridi-glaucescent*, glaucous-green.
*Viridulo-cinerascent*, greenish-grey.
*Vitellinous-yellow*, yellow like the yolk of an egg.
*Vermiculari-elongate*, lengthened out like a worm.
*Vermiform*, worm-like.
*Vermiformi-cylindrical*, cylindrical and twisted like a worm.
*Ventricoso-fusiform*, of a swollen or inflated spindle-shape.
*Verrucaroid*, having fruit like the verrucæ or apothecia of a *Verrucaria*.
*Verrucæ*, small wart-like tubercles or elevations of the thallus.
*Verrucæform*, of a wart-like tubercular form.
*Verrucose*, wart-like.
*Verrucoso-areolate*, composed of wart-like areolæ.
*Verrucoso-areolato-diffract*, broken up into verrucose areolæ.
*Verrucoso-confluent*, with warts growing together.
*Verrucoso-conglomerate*, in clustered verrucose portions.
*Verrucoso-diffract*, divided by chinks into wart-like areolæ.
*Verrucoso-glebulose*, having crumb-like warts.
*Verrucoso-glomerulose*, conglomerated into wart-like heaps.
*Verrucoso-granulate*, a thallus composed of verrucæ and granules.
*Verrucoso-leprose*, with warty scurf.
*Verrucoso-papillate*, having papillæ-like warts.
*Verrucoso-rugose*, with wrinkled warts.
*Verrucoso-scabrous*, roughened with warts.
*Verrucoso-sorediate*, having wart-like soredia.
*Verrucoso-squamose*, consisting of scaly warts.
*Verrucoso-tomentose*, warty and tomentose.
*Verrucoso-tuberculose*, having wart-like tubercles.
*Verrucoso-unequal*, unevenly wart-like.
*Verruculoso-cinerascent*, consisting of ashy-grey small warts.
*Verruculoso-scabrous*, roughened with very minute warts.
*Verticillato-proliferous*, becoming proliferous, whorl above whorl.
*Waxy*, of a wax-like consistence or aspect.
*Zonate*, marked with concentric wavy undulations.

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# ADDITIONS AND CORRECTIONS.

*Pycnothelia apoda*, Nyl. *white or whitish*, thin, *slightly granuloso-crustaceous*, everywhere sparingly producing small erect abortive, ellipsoideo-vesiculose or subgranuliform podetia; *apothecia entirely sessile on the thallus, ferrugineo-rufous or rufo-ochraceous*, opake, plane, immarginate or somewhat convex; spores fusiformi-oblong; paraphyses moderate; epithecium rufo-fuscescent.

On the earth, rare. 1878.

SYN:—Nyl. in Flora 1878, p. 241.
GEOG. DISTRIB:—France.
BOT. PROV:—26.
IRELAND:—Kylemore. *Mr. Larbalastier.*
"Spores .057—.010 mm. long, .004 mm. broad. Thecæ I blue then lutescent, apices obscurate. Probably a subspecies of *P. papillaria*, but the apothecia are sessile on the basal thallus, and often aggregate. Thallus K yellow. Spermogonia commonly inclosed in the hymenium without any distinct conceptacle; spermatia arcuate .008—.012 mm. long, .0005 mm. broad." *(Nyl.)*

*Pannaria melantera*, Stirt. *black*, effuse, deeply and widely *diffract* or rather *squamose, squamæ* thickish, minutely *papillose, nigro-cærulescent beneath;* apothecia black, small, sessile, plane, or somewhat convex, margin black and shining; paraphyses thickish, articulate, apices clavate cærulescent; hypothecium fuscescent; *spores* 8, colourless, oblong, 1-3 *septate* or *simple.*

On micaceo-schistose rocks, rare. 1878.

SYN:—Stirton in Scott. Nat. Jan. 1879, p. 16.
BOT. PROV:—15.
SCOTLAND:—Ben Lawers. *Dr. Stirton.* (1878.)
Similar to *P. dolichotera*, Nyl., but with longer spores, .03—.045 mm. long, .0045—.005 mm. broad. Gelatina hymenea I cærulescent, thecæ fulvescent.

*Lecidea pulchella*, (Schrad). *sulphureo-citrine or bright virescenti-yellow*, orbicular, rotundato-lobate in the circumference, *gyroso- or bullato-plicate*, thick, smoothish; hypothallus spongiose black; *apothecia black*, naked, arising from the hypothallus *between the folds of the thallus*, single or clustered, *subimmerso-appressed*, plane, at length convex, the obtuse margin obliterated, internally black; excipulum black, hypothecium dark-fuscous-black; paraphyses cohærent, yellowish-fuscescent, apices fuscous; spores 8, fuscous, ellipsoid or *oblong, broadly-rounded at the ends*, constricted in the middle, 1-*septate*, epispore moderate.

On the earth among alpine rocks, very rare. 1842.

Syn :—Schrad. Journ. Bot. I. p. 74. (1801.) *L. Wahlenbergii*, Ach. Meth. 81. Syn. 50. *L. galbula*, Nyl. Scand. 247.
Fig :—Sturm D. Fl. t. 28. excl. C. Hepp Sporen t. 63. f. 549. Mass. Ric. f. 170.
Exs :—Hepp 542. Schær. 166. Anzi Langob. 134.
Geog. Distrib :—Norway, Sweden, Lapland, Switzerland, E. Pyrenees, Lombardy.
Bot. Prov :—15.
Scotland :—"West side of Ben Nevis! about three parts up, above Loch Nevis, Invernesshire." *Mr. F. Bainbridge* (July 1842.)

*Lecidea mucosa*, Stirt. *fulvous, gelatinous*, or evanescent; *apothecia fuscous or fuscous-black*, somewhat plane, *convex or almost sphærical*, small, *internally fuscescent* or pallido-fuscescent; *hypothecium fuscous;* paraphyses conglutinate indistinct, apices colourless, not clavate; spores 8, colourless, ellipsoid, simple.

On putrid wood, rare. 1878.

Syn :—Stirton in Scott. Nat. Jan. 1879 p. 17.
Bot. Prov :—15.
Scotland :—near Ben Doran. *Dr. Stirton.* (1878.)
Spores .0075—.01 mm. long, .004—.0055 mm. broad. Gelatina hymenea I blue then dirty.

*Lecidea insita*, Stirt. parasitic, *apothecia black*, small, *convex*, immarginate. generally *nearly sphærical, internally rufescent; spores* 12-16, colourless, *sphæroid*, simple; paraphyses distinct, slender, filiform, apices rufous or almost colourless; hypothecium rufous or rufous-black.

Parasitic on thallus of *Peltigera aphthosa*, 1878.

Syn :—Stirton in Scott. Nat. Jan. 1879, p. 17.
Bot. Prov :—15.
Scotland :—Craig-na-Lochan. *Dr. Stirton.* 1878.
Allied, perhaps too closely, to *L. geophana.* Gelatina hymenea I intense-blue, then intense-vinous-red.

*Lecidea fucata*, Stirt. *cinereous, granulose*, or evanescent; *apothecia black*, round or oblong, or somewhat irregular, convex and immarginate, *internally entirely of an intense-violet colour*, scarcely changed by iodine, K cæruleo-virescent; *spores* 1-3, *colourless, ellipsoid* or *oblongo-ellipsoid, simple*, epispore thick and pellucid; *hypothecium colourless.*

On decorticated wood, rare. 1878.

Syn :- Stirton in Scott. Nat. Jan. 1879, p. 16.
Bot. Prov :—15.
Scotland :—Near Tyndrum, Perth. *Dr. Stirton.* (1878.)
Probably allied to *L. melina.* K tinges the protoplasm of the mature spores of a nigro-fulvaceous colour. Spores .032—.048 mm. long, .015—.022 mm. broad. Paraphyses distinct, thickish, irregular.

*Opegrapha mirifica*, Stirt. *whitish or albido-cinerascent*, thickish, *minutely rimulose*, sometimes nearly granulose, sometimes farinaceous, (K—C red but C alone—); *apothecia black*, moderate, sessile, *round or oblong, scattered or aggregate; epithecium cæsio-pruinose or naked*, at first somewhat concave and then acutely margined, at length plane, often somewhat convex and immar-

ginate; hypothecium black or fuscous-black, thick; paraphyses irregular, indistinct, apices clavate, nigricant; *spores* 8, *colourless*, oblong or obtusely fusiform, 3-*septate*.

On rocks, rare, 1878.

SYN :—Stirton in Scott. Nat. Jan. 1879, p. 17.
BOT. PROV :—16.
SCOTLAND :—Island of Cumbra, Bute. *Dr. Stirton.* (1878.)
Spores .014—.021 mm. long, .0035—.0045 mm. broad. Gelatina hymenea I vinous-red.

*Verrucaria Mortarii*, Arn. *(in hb. Lamyi.) dirty-whitish*, thin, minutely *areolato-rimose*, firm, unequal; *apothecia black immersed; ostiolum* somewhat *prominent; perithecium dimidiate*, black; paraphyses none; filamenta ostiolaria slender; spores 8, colourless, oblong, simple, granular.

On stones, rare, 1878.

SYN :—Nyl. in Flora 1878 p. 344.
BOT. PROV :—4.
ENGLAND :—On walls of Quy churchyard! Cambridgeshire. *Mr. Larbalestier.* (1878.)
"Spores .027—42 mm. long, .017—18 mm. broad." *(Nyl.)* Spores .027—.031 mm. long, .014—.016 mm. broad.

p. 337. Mr. Larbalestier says Nylander now regards *Lecidea rupicola*, Nyl. as *Lecanora bœomma*, Nyl.
p. 338. *Lecidea atropurpurea*, Schær. abundant on trees, Derryclare Island, Connemara. *Mr. Larbalestier.*
p. 340. "Mwerlan" should always be written "Mweelan."
p. 341. "Rinvyle" should be "Renvyle" always.
p. 341. Mr. Larbalestier says "the supposed *saxicole* state of *Lecidea cyrtella*, Ach. from Ann Port, Jersey, Nylander long ago informed me was only *Lecanora Hutchinsiæ*, Nyl."
p. 343. *Lecidea erysiboides*, Nyl. Gloucestershire, *Mr. Joshua.*
p. 363. "*Lecidea chlorotica*, Ach. forma *albescens*, Hepp. on pines near Newmarket, Cambridgeshire." *Mr. Larbalestier.* (1878).
p. 221. "Glencorbol" should be "Glencorbot" passim.
p. 210. For "Corig" read "Cong" always,
p. 358. *L. ternaria* Nyl. var. with 3-septate spores .016—22 mm. long, .005—6 mm. broad; thecæ I persistently blue; on Mosses in Ireland. *Mr. Larbalestier.* Nyl. in Flora. 1878, p. 248.
p. 335. Nyl. in Flora, 1878, p. 248 says that *Lecidea Gagei* (Sm.) Hook. is *L. lenticularis* "apotheiciis rufescentibus vel pallidis," as frequently collected in Ireland by Gage, Taylor, and Larbalestier.
p. 303. Nyl. in Flora, 1878, p. 248, says that *L. albocærulescens var. alpina*, Schær. is *L. phœnterodes*, Nyl. in Flora, 1875, p. 363.
p. 130. *Parmelia xanthomyela*, Nyl.! & *Parmelia McMilliana*, Stirt.! are identical with *Parmelia endochlora*, Leight.!!
p. 212. Mr. Larbalestier finds *Lecanora hæmatites*, (Chaub.) in very fair quantity on the branches of very young trees near Cherry Hinton, Cambridgeshire (1878).
p. 339. T. M. Fries L. Scand. p. 564, says that *Lecidea luteella*, Nyl. & *L. Arnoldi*, Krmphbr are identical.

Mr. McAndrew has sent me from New Galloway, Kircudbright (13):—

Umbilicaria erosa.
Leptogium Burgessii.
Leptogium muscicolum (in fruit).
Collema aggregatum.
Platysma triste.
Platysma commixtum.
Peltigera aphthosa.
Peltigera rufescens.
Parmelia incurva.

Parmelia Borreri.
Parmelia lanata.
Calicium trachelinum var. hemiplodum. *Nyl.*
Lecidea lutea.

p. 213. Vale Castle, "Guernsey," not "Jersey."
p. 216. for "Ninmont Hill," read "Noirmont Hill" & passim.
p. 216. for "Beaufort" read "Beauport."
p. 217. for "Le Moye" read "La Moye" and passim.
p. 220. for "Mont Orgueal" read "Mont Orgueil" & passim.
p. 212. Mr. Larbalestier finds *Lecanora arenaria*, Pers., frequent on Church walls and old bridges about Cambridge (4).
p. 241. for "inculpted" read "insculpted."
p. 242. for "L. rhizbola" read "L. rhizobola."
p. 244. under L. lurida, add
CHANNEL ISLANDS :—Locquaine Hill, Guernsey, Janvoins Tomb, Rozel, Jersey. *Mr. Larbalestier.*
p. 257. for "cinerous" read "cinereous"
p. 263. for "L. accesitans" read "accessitans."
p. 265. to L. tenebricosa add
IRELAND :—Holy Island, Lough Inagh, Connemara. *Mr. Larbalestier.*
p. 268. for "cinerous" read "cinereous."
p. 271. for "Lough Teagh" read "Lough Feagh."
p. 220. to *L. Ralfsii*, Salw. add.
IRELAND :—near Kylemore. *Mr. Larbalestier.*
p. 386. to L. Parmeliarum, add common in Connemara, *Mr. Larbalestier.*
p. 391, for "A. laricicola" read "X. laricicola."
p. 392. under Agyrium rufum add Ballynahinch, Connemara. *Mr. Larbalestier.*
p. 406 to Opegrapha varia add *f. lutescens*, Ach. Noirmont, Jersey, *Mr. Larbalestier.* and Raglith, near Church Stretton, Salop. Epithecium lutescent.
p. 408. Mr. Larbalestier informs me that Opegrapha hapaleoides from Clifton, Somersetshire, is now regarded by Nylander as *Opegrapha agelæoides*, Nyl.
p. 416 to *Arthonia excipienda*, add Doughruagh Mountain, Kylemore. *Mr. Larbalestier.*
p. 34 for *L. musicolum*, (Sw) read *L. muscicolum*, (Sw.)

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